

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—25TH YEAR.

SYDNEY, SATURDAY, JANUARY 29, 1938.

No. 5.

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Report of the Queensland Royal Commission on Modern Methods for the Treatment of Infantile Paralysis.

THE report of the Royal Commission appointed in October, 1935, to investigate the modern methods of the treatment of infantile paralysis and other diseases of a paralytic nature has been published. Much publicity has been given to this subject in the

daily Press; extracts from the report have also been published. Since the views of the commissioners can be obtained only by a study of the whole report, it is reproduced here *in extenso*. For this purpose all original articles have been omitted from this issue.

INTRODUCTORY.

The work of Miss Kenny in the treatment of infantile paralysis was known to several practitioners in Queensland for quite a number of years. It was chiefly by the publicity attending the opening of the Townsville clinic and the reports on the work of that clinic that it became known throughout the State. When the clinic was opened in Brisbane a number of medical men attended out of personal interest to observe results; but it was at Miss Kenny's own request that a committee was eventually appointed to observe cases before, during and after treatment and to report thereon. The committee first appointed were: Dr. C. A. Thelander, Chairman, Dr. A. J. McDonnell, Dr. Jarvis Nye, Dr. Bostock, Dr. J. R. S. Lahz, Dr. Paterson and Dr. J. V. Duhig; Dr. Rountree as liaison officer. Later, Dr. Leslie Gibson joined and Dr. Bostock resigned.

These commissioners were selected with the approval of Miss Kenny, as shown by her letter:

Dr. Lahz,

Brisbane.

Dear Doctor,

You will regard this letter as an official communication from myself appointing Drs. Aeneas McDonnell, A. Paterson, J. Duhig, Bostock, Nye, Thelander, Gibson and yourself as Committee appointed by me to observe the results of the treatment of Paralysis—Poliomyelitis, Spastic, and Birth, and to compare these results with those obtained by orthodox methods.

I may find it necessary on the advice of the Superintendent of the Clinic, or on the advice of the Committee to add to the above Committee any further member whom I may consider a fit person to be sitting on such.

I am aware that you are negotiating with the Government to acquire official Government status for the purpose of this inquiry. You are doing this with my full consent.

I would be glad also if you would place as liaison officer between the Committee and the Clinic, Dr. Rountree, or in the event of the resignation of Dr. Rountree, her successor.

Yours truly,

(Sgd.) E. KENNY.

As soon as the committee met to discuss the scope and authority of its report it realized that the

position might be unsatisfactory as regards powers and unsafe as regards privileges. It was therefore agreed that the status of a Royal Commission be sought. This was supported by Sister Kenny and the commission was duly appointed, the terms of reference being:

QUEENSLAND GOVERNMENT GAZETTE.
Saturday, 26th October, 1935. No. 98.

WHEREAS it is expedient in the public interest that full inquiry should be made into modern methods for the treatment of infantile paralysis and other diseases of paralytic nature, and without limiting the generality of the foregoing reference to investigate in particular the Elizabeth Kenny method of treating infantile paralysis, spastic paralysis, and birth palsy, and to compare the results of the Kenny method and the results of orthodox treatment; Now, therefore, know ye, that we, reposing especial trust in your zeal, knowledge, learning, industry, discretion, and ability, do by these presents, by and with the advice of our Executive Council of Our State of Queensland, constitute and appoint you the said CHARLES AUGUST THELANDER, AENEAS JOHN McDONNELL, LESLIE JOHN JARVIS NYE, RUDOLPH SERGIUS LAHZ, ALEXANDER EDGAR PATERSON, JAMES VINCENT JOSEPH DUHIG, LESLIE WYLIE NORMAN GIBSON, and JOHN BOSTOCK to be our Commissioners for the purpose of inquiring into the matters hereinbefore mentioned and any other matter pertaining thereto as to you should seem meet: And we do hereby require and enjoin you to make diligent inquiry into the matters aforesaid, and for the purpose to exercise all the powers conferred upon a Commission by "The Official Inquiries Evidence Acts, 1910 to 1929" or any Act or Acts in substitution therefor or in amendment thereof: And we do furthermore command and enjoin you to summon before you and to examine all such persons as may appear to you able to inform you concerning the premises and to cause to be taken down in shorthand and reduced into writing the evidence of the several witnesses that may appear before you, and such evidence, together with a full and faithful report touching the matters aforesaid, to transmit to the Honourable the Premier and Chief Secretary and Treasurer of Our said State: And we do hereby appoint you, the said CHARLES AUGUST THELANDER, to be Chairman of this Our said Commission.

In testimony whereof We have caused the Public Seal of Our said State to be hereunto affixed.

Witness Our Right Trusty and Well-beloved His Excellency Sir LESLIE ORME WILSON, Colonel on the Retired List of Our Royal Marines, Knight Grand Commander of Our Most Exalted Order of the Star of India, Knight Grand Commander of Our Most Eminent Order of the Indian Empire, Companion of Our Most Distinguished Order of St. Michael and St. George, Companion of Our Distinguished Service Order, Governor of Our State of Queensland and its Dependencies, in the Commonwealth of Australia, at Government House, Brisbane, this twenty-fourth day of October, in the year of Our Lord one thousand nine hundred and thirty-five, and in the twenty-sixth year of Our Reign.

(Signed) LESLIE WILSON.

By His Excellency's Command,

(Signed) W. FORGAN SMITH.

(Signed) G. W. WATSON,

Under Secretary,
Chief Secretary's Department.

Discussing the programme of work, the commission soon realized that no report could be issued within twelve months. The first task was the examination of cases to be reexamined in about six months' time. A system of recording results was agreed upon and examinations were undertaken

from October 7, 1935. It was felt advisable that an orthopaedic surgeon be present at every examination—this limited the number to two cases per session. The commission, which was of course appointed without salary, attended the clinic twice a week. It was soon found that the examination of spastic cases must be conducted on somewhat different lines and by one single individual, and this task was relegated to Dr. A. E. Paterson.

It became very soon evident that, in spite of the comprehensive terms of reference, this commission was faced with more than the ordinary task of a scientific inquiry, in which all interested parties desired only the exposition of truth.

The claims of Miss Kenny had been brought to the notice of the State Government two years previously, and steps had been taken to receive professional advice in the matter. The first investigation was conducted by Sir Raphael Cilento—borrowed, in the first place, from the Commonwealth Health Department, but subsequently acting as Director-General of Health and Medical Services for the State.

In his first report, dated December 12, 1933, Sir Raphael states:

In the demonstration to which reference was made in the first part of this report, it was obvious that massage students and others present were impressed by the facts:

(1) that the movements themselves, active and passive, offered no indication of any fundamental departure from present-day massage methods;

(2) that the removal of splints and other supporting apparatus was contrary to accepted practice;

(3) that violent force applied to limbs was definitely contraindicated by accepted methods and was liable to produce injury;

(4) that no cases were presented for their observation to demonstrate the definite nature of the cure established; while

(5) references by Sister Kenny to such matters as "the dimple in the back of the neck" were regarded as ludicrous, and produced a bad impression.

In this report a commentary by Dr. Harold Crawford was added. He noted at the demonstration:

(1) At the commencement of this treatment all splints were discarded; Miss Kenny is not in favour of splints; when questioned *re* the possibility of the formation of deformities no opinion was given, except that they did not occur.

(2) Forcible movements only were given; she does not agree with "gentle re-education".

(3) Only gross movements were performed at the different joints; thus flexion and extension at the ankle and knee, etc. No attention was paid to the re-education of group muscles.

(4) A great deal of mental suggestion was used and no patients which were mentally defective were considered suitable.

Miss Kenny stated:

(1) No case was taken on unless the patient was declared hopeless by a recognized orthopaedic surgeon.

(2) All patients have been cured, one after a lapse of 30 years.

FOR:

(1) She has had the welfare of the children at heart and has given them unremitting attention and care.

(2) She is making use of hydro-therapy, thus taking the weight off the limb while being exercised.

(3) Some of the recognized movements and manipulations are being carried out.

AGAINST:

- (1) Splints are discarded.
- (2) Miss Kenny is not a trained masseuse and is not registered to carry out the work, which is essentially a part of physio-therapy.
- (3) No reason can be given why the different movements are carried out, nor why any benefit should accrue therefrom.
- (4) The movements and manipulations are severe and forcible; she stated: "all one's power must be put into this".
- (a) May cause fracture of a limb; this is a real danger, as the bones of these children are very friable.
- (b) In recent cases and in those where there is a feeble return, forcible handling will increase the paralysis.
- (5) This treatment could not be described as "a new method"; the movements and manipulations are among those already used, but in this case we consider they are used in a wrong and even harmful manner; suggestion plays an important part in the treatment of these patients.
- (6) Miss Kenny has no knowledge of the: (1) Anatomy of the muscles she is undertaking to treat. (2) Pathology of the diseases. (3) Physiological effect of the treatment, i.e., why the different movements are carried out or how they produce a beneficial effect.
- (7) Miss Kenny makes some very sweeping claims for her treatment. She has been carrying out this treatment for ten years and has treated thirty patients.

In a further report to the Minister for Health and Home Affairs, dated August 9, 1934, Sir Raphael Cilento's statement may be summarized:

It is my considered opinion after careful examination of all the circumstances:

1. That Sister Kenny has failed to train nurses to proficiency in the time available.
2. That the patients brought for treatment to the clinic (at Townsville) are of several types: (a) Neglected cases. (b) Cases insufficiently treated. (c) Cases where the processes of natural repair were already at work. (d) Cases of functional origin. (e) Cases unsuited to this type of treatment (a few).
3. That the constant attention to general measures, such as bathing and cleanliness, exercise, housing and nutrition, coupled with a sympathetic attitude of encouragement, materially improves the general health and mental outlook of all cases, as might be expected.
4. That in respect of a paralysed limb, reliance is readily and generally reposed in the other limb of the pair or in substitute action or apparatus; that where there is disuse, coupled with acquired substitute action, and a conscious acceptance of the paralysis and of the consequent negligibility of the affected member and its neighbouring muscular groups, the function of the whole limb is generally sacrificed to the effect of a part; that, in such cases, the patient can readily be persuaded to re-learn normal function up to the point of restoration of whatever was merely latent. Such apparent restoration of function is rapid and surprising in the early stages, and these rapid early results appear to promise an equally happy final result and complete recovery. No case of the series known to me had definitely yet reached such a final stage of recovery; and this is the critical test of the matter. (See No. 5.)
5. That it must not be overlooked that the objective of treatment is the saving of the country from the burden of pension commitment, by the restoration to the patient of function adequate to permitting his normal life as a citizen earning a living. Short of such a result it is doubtful whether it is worth while either to the patient or the public, to transform a physically low-grade potential pensioner into a physically high-grade pensioner, none the less dependent. The mere improvement of nutrition in a limb, or the restoration of function to a degree below this requirement, incompletely fulfills the justifiable purposes of this clinic.

6. That the clinic has expanded at a rate beyond the capabilities and the proficiency of the staff, and is liable for that reason to defeat its own purpose. If it is to be continued its numbers should not be permitted to exceed 20, vacancies being permitted only as patients are dismissed actually cured. The multiplication of those receiving treatment is otherwise unwise. Until such demonstrations of final success have been attained, and in consideration of the major issues involved, premature expansion invites future difficulties.

7. That the individual conclusion of both Sister Kenny and Dr. R. W. Dungan that sweeping re-organizations are essential to the success of the clinic if it is to be continued, are supported by the present observer.

Here at the outset is conflicting evidence. In Dr. Crawford's report it is stated that Miss Kenny had claimed "to have treated thirty cases" and that "all cases had been cured, one after a lapse of 30 years". Sir Raphael Cilento reported that "no case of the series known to me had definitely yet reached such a final stage of recovery".

Reporting later to the Minister (the Honourable E. M. Hanlon, M.L.A.), Sir Raphael Cilento comments on Dr. Guinane's report, dated early in 1935.

He [Dr. Guinane] states that Sister Kenny has never claimed to do more than to relieve late cases; and that it would be absurd to suppose anyone could cure them. This is precisely what the medical profession asserted. They said they were incurable; Sister said she would cure them to 100%.

In other words the sum total of the Guinane report is: (1) Sister Kenny cannot cure late cases of paralysis. (2) The benefit she gives some of them is not of economic but of sentimental value. (3) She has assisted several early cases that might, however, have done well under the usual medical treatment.

Sir Raphael reports concerning the 16 cases first seen 18 months ago as follows:

Two (but not typical cases) have been marked as not needing further treatment. Two are doing well and recovering slowly. Seven are stationary after early progress. Five have abandoned treatment.

In a memo dated May 15, 1935, addressed to the Minister (the Honourable E. M. Hanlon, M.L.A.), Sir Raphael Cilento writes:

The following action is suggested for the consideration of the Minister:

- (1) The opening of a register for the names of all children affected with paralysis. This might later be compulsory.
- (2) The appointment of an expert committee of medical men and orthopaedic surgeons to assess the extent of affected persons' disability and the probabilities of cure.
- (3) The treatment of approved cases in the Infantile Paralysis Clinics at Townsville and Brisbane.
- (4) Regular reports from time to time as to progress with various methods; as Sister Kenny's method; Sister Wright's method; other approved methods.
- (5) The control of this programme by myself as Director-General of Health. The attention of the Minister is directed to the fact that Sister Kenny's letters are being composed by persons who are interested in discrediting me prior to the formation of the new Ministry of Health.

To this memo the Minister's reply is:

Take steps to prepare a registry of all sufferers paralysis.
May 16, 1935. E.M.H.

The sequel to this correspondence was a verbal instruction from the Minister (the Honourable E. M. Hanlon, M.L.A.) to Sir Raphael Cilento in May, 1935:

In my own interests and in order not to hamper government business, to have nothing further of any kind to do with the Kenny Clinic.

Having now discarded its first professional adviser, the Government appointed the present commission with the terms of reference above detailed.

Early in 1936 two members of the commission (Dr. Duhig and Dr. Lahz) went to Europe, and Dr. A. J. McDonnell, who was not in good health, went on a tour to Japan.

Feeling now that the work was not progressing as fast as it should, the commission requested the appointment of two additional members, Dr. Meehan and Dr. Lee. Sister Kenny agreed to this, and at the request of the commission these doctors were approached by the Government asking them would they agree to serve on the commission. Both signified their agreement and awaited formal notice of appointment. The correspondence is quoted hereunder:

Letter from the commission to the Honourable E. M. Hanlon, dated March 12, 1936:

The Royal Commission on the Investigation of Paralysis will shortly be losing two of its members, Dr. Lahz and Dr. Duhig, who are going on an extended visit to Europe. It was felt in view of this to be imperative that the Commission be strengthened by the addition of an Orthopedist, and the members of the Commission were unanimous in expressing the wish that Doctor Meehan should be invited to join the Commission.

Dr. Meehan's experience and professional standing are such, that should he accept appointment, we have no doubt the work of the Commission will be expedited and made more authoritative by his assistance.

Letter from the commission to the Honourable P. Pease, dated March 22, 1936:

The Royal Commission on the Investigation of Paralysis will shortly be losing two of its members, Dr. Lahz and Dr. Duhig, who are going on an extended visit to Europe. It was felt in view of this to be imperative that the Commission be strengthened by the addition of an Orthopedist, and the members of the Commission were unanimous in expressing the wish that Doctor Meehan should be invited to join the Commission.

Doctor Meehan's experience and professional standing are such, that should he accept appointment, we have no doubt the work of the Commission will be expedited and made more authoritative by his assistance.

Letter from the commission to the Honourable E. M. Hanlon, dated March 22, 1936:

In the matter of the appointment of Dr. A. V. Meehan to be a Royal Commissioner on the Investigation of Paralysis, I desire to inform you that, as our Commissions were issued by the Honourable the Premier, the Commission's request has also been made direct to the Honourable the Deputy Premier.

Letter from the Department of Health and Home Affairs to the commission, dated March 2, 1936:

With reference to your letter of the 22nd ultimo, addressed to the Acting Premier, I have the honour, by direction, to inform you that Dr. A. V. Meehan and Dr. A. E. Lee, of Brisbane, have been invited to become members of the Royal Commission on the Investigation of Paralysis in consequence of the departure of Dr. Lahz and Dr. Duhig who are going on an extended visit to Europe.

Letter from the commission to the Department of Health and Home Affairs, dated May 8, 1936:

Adverting to previous correspondence and your letter of the 2nd March last (36/1453 Medical), I have, by direction of the Royal Commission on the Investigation of Paralysis, to again request the early appointment of Doctors A. V. Meehan and A. E. Lee as Members of the Commission, as their services are urgently needed.

Letter from the Chief Secretary's Office to the commission, dated May 13, 1936:

Referring to your letter of the 8th instant, addressed to the Under Secretary, Department of Health and Home Affairs, respecting the appointment of Doctors A. V. Meehan and A. E. Lee as Members of the Royal Commission to investigate Paralysis, I am directed to inform you that the question of the proposed appointment of additional members of the Commission is still under consideration by Cabinet.

Letter from the commission to the Chief Secretary's Department, dated June 24, 1936:

Adverting to your letter of the 13th ultimo (36/2786 Home) in connection with the appointment of Doctors A. H. Meehan and A. E. Lee as Members of the Royal Commission on the Investigation of Paralysis, I have the honour, by direction of the Commission, to inquire as to the present position in this matter.

Letter from the Chief Secretary's Office to the commission, dated July 15, 1936:

I am directed to refer to your letter of the 24th ultimo and previous correspondence respecting the recommendation of the Royal Commission on the Investigation of Paralysis that Doctors A. V. Meehan and A. E. Lee be appointed additional Members of the Commission; and to inform you in reply thereto, that the matter has received careful consideration, but it is considered that the present personnel of the Commission is adequate for the purpose for which it was appointed.

The commission fails to understand the action of the Government in thus hampering its activity. The additional cost involved would have been only one of stationery. The commission feels that the Government could not have questioned the capacity of these gentlemen, one being the Senior Orthopaedic Surgeon of Brisbane and a man who has repeatedly visited both Europe and America to keep in touch with the latest developments of his profession, the other a surgeon with high Australian and English qualifications.

The commission was given adequate access to patients by Miss Kenny and was able to see the work in progress reasonably well. The first cases were selected for examination by Sister Kenny; subsequently newly admitted cases as far as possible were taken on arrival or soon after. Reexaminations commenced on June 9, 1936.

The commission has made various inquiries relevant to its terms of reference and has received generous consideration from overseas authorities; a great deal of authoritative material being submitted. From hospitals in Australia the response has been very disappointing; very little information has been furnished. This dilatoriness of Australian hospitals contrasts sadly with the promptness and courtesy of authorities overseas.

Certain reports were received early in our inquiries alleging injurious effects resulting from treatment at Miss Kenny's hands; these have been carefully investigated and will be referred to later.

From the beginning the commission was made aware of the atmosphere of antagonism which had been aroused by public discussion and by Press reports.

This may perhaps explain some of the conflicting statements in reports and in correspondence submitted. Some examples merit study.

(1) Miss Kenny's claims; it is now difficult to find what were the original claims. In a memorandum from Sir Raphael Cilento is found the statement: "Sister said she would cure them all to 100%."

Dr. Guinane's report (page 4) states "it must be understood that Sister Kenny's claim that she could cure cases of infantile paralysis referred to cases that she was allowed to treat from the beginning—her only claim with regard to old cases was that she could improve them". (Presumably this means "cure them all"—otherwise there is no claim beyond that of the orthopaedic surgeon.)

In Dr. Dungan's report (September, 1934) are the statements (pages 3 and 4).

The essential thing to note about Sister Kenny's method is that it is *not a system of massage or of exercises*.

She revises the present accepted opinion and places re-education first and splinting second.

The outstanding feature in her method of treatment is what she calls vibratory massage.

This consists of holding the part in certain positions—mainly at insertions of tendons and muscles, with a firm grip, but *not* transmitting heavy pressure to the deeper structures.

To do this the operator firmly contracts his own muscles, which quiver and transmit a vibration to the muscles and joints that are involved in the movement desired. While this vibratory pressure is applied the movement desired is performed on the patient by the operator all the time directing the patient to attempt the voluntary movement.

This proceeding is really a method of *stimulating proprioceptive impulses* and may even bring them into the level of consciousness.

Miss Kenny, September 7, 1934, refers to the foregoing as "interesting résumé of method". (Italics by Dr. Dungan.)

The superb optimism that Sister Kenny possesses is remarkable. Every patient should be placed in the right psychological atmosphere and frame of mind. The latter statement is the explanation of why Sister Kenny considers that her results would not be as good if she had to work in hospital surroundings.

Be the responsibility where it may, the commission has no doubt that the public was led at the outset to expect cures in all cases.

Yet, in her evidence of February 17, 1937 (page 46), Miss Kenny states that she never authorized that statement at all. She admits that certain cases must be regarded as incurable:

If the impulse is destroyed you will never get it back. The only thing I have ever said has been that if the medical profession had had our services when it had certain cases to deal with it would have had very much better results.

("Our services" implies the services of Miss Kenny and her trainees instead of that of masseurs trained on customary lines.)

In her text-book, moreover, there is no mention made of the term "vibratory massage"; the instructions are those for ordinary reeducational movements.

The foregoing illustrates the foggy atmosphere, ever-changing claims and methods, and conflicting reports from professional observers in which the commission started its work.

Miss Kenny's Demonstrations.

There have been various demonstrations by Miss Kenny before public men. This commission attended one which was arranged for the attendance of the Honourable W. M. Hughes.

It is regrettable to have to state that the cases presented to contrast her methods as against standard procedures were not at all comparable cases in regard to the severity of the disease.

A notable instance of such evidence was the occasion when at a Christmas tree festival the Honourable E. M. Hanlon, M.L.A., invited the attention of the public to the little girl who walked up to present Miss Kenny with a bouquet. This child, he informed the audience, had been carried into the clinic a few months previously. Such a statement and demonstration would have been much less impressive if the Honourable Minister had been told and had added that: (i) This child had never had paralysis of the legs. (ii) The paralysis she had, affecting the arm and shoulder, was (and still is) in a very far from satisfactory condition.

Previous Offer of Professional Cooperation with Government on Behalf of Cripples.

The following correspondence indicates the conservative attitude of the department regarding the effort of the Massage Association to cooperate in the treatment of paralytic cripples in country centres, and invites contrast with the enthusiastic adoption of Miss Kenny's proposals.

Letter from the Australasian Massage Association to the Home Secretary, dated March 11, 1932:

In the event of cases of Infantile Paralysis in the country being brought to different centres for treatment, and should Masseurs be required, we would request that appointments be made from members of the Queensland Branch of the Australasian Massage Association who have been specially trained for such work.

Letter from the Home Secretary's Office to the Australasian Massage Association, dated March 16, 1932:

I have the honour to acknowledge receipt of your letter of the 11th instant, addressed to the Home Secretary, asking that appointments of Masseurs for treatment of cases of Infantile Paralysis be made from members of your Association and to inform you that your communication will be brought before the Minister on his return to Brisbane.

Letter from the Australasian Massage Association to the Home Secretary, dated March 12, 1934:

Referring to your letter of 22nd ultimo (No. 34, 1066 Masseurs), the deputation from the above Association are desirous of discussing with you the question of the extension of Massage facilities in Queensland.

We feel that Massage is now taking a definite position in the Medical world in the treatment of injuries and many diseases.

The term Massage includes Massage, Medical Electricity, Medical Gymnastics and Muscle Re-education.

This treatment should be available to all sections of the community. At present this is not so. The Brisbane General, Mater Public, Toowoomba General, Maryborough General and Townsville General Hospitals are the only hospitals in Queensland where this treatment can be obtained.

We should like to suggest that such an objective can be attained by the equipment of Physio-therapy Departments in all the large public hospitals. Qualified Masseurs could then be appointed on the full-time or part-time basis with the right of private practice. In this way many country people would be able to receive treatment which is not available to them in the present existing circumstances.

Hoping that you find it convenient to receive us at an early date.

Letter from the Home Secretary's Office to the Australasian Massage Association, dated March 22, 1934:

Referring to your letter of the 1st instant with regard to your Association's request for a deputation to the Home Secretary for the purpose of discussing the question of Massage in Queensland, I have the honour, by direction, to inform you that the Minister will be glad to have a written statement of the matters which it is proposed to discuss. Upon the receipt of this statement the Minister will endeavour to arrange a date for the deputation.

Extract from recommendations from the Nurses and Masseurs' Registration Board:

In recent years the advantages of Massage or Physiotherapy are being realised and equally so the need for completely trained individuals in the practice of the same in all country centres. Yet it is a notable fact that there is not available to patients outside Brisbane—except in one or two country centres—the services of properly trained Masseurs or Physio-therapists. In any scheme intended to offer facilities for training it is imperative that the needs of the community should be considered and at the same time that, as far as possible, individuals should not be unwisely urged to enlist in an overcrowded service. It is recognised in this connection that a very material help would be rendered if all country hospitals were equipped insofar as Massage service is concerned. The institution of such would enable country patients, who cannot afford to visit Brisbane or other large centres, to have treatment in their own country centres. There is little doubt that many needy country individuals are denied competent treatment on these grounds. By offering, at least, part-time positions to competently trained Physio-therapists there would be an enticement for settlement of such persons in country centres.

Letter from the Home Secretary's Office to the Australasian Massage Association, dated December 4, 1933:

With reference to your letter of the 18th ultimo, asking the Home Secretary to receive a deputation from your Association for the purpose of discussing the question of Massage in Queensland, I have the honour, by direction, to inform you that the Minister will be unable to arrange a date for the deputation this year, but will endeavour to do so early in the New Year.

Letter from the Australasian Massage Association to the Home Secretary, dated November 18, 1933.

Representatives of the Queensland Branch of the Australasian Massage Association are desirous of meeting you to discuss the question of Massage in Queensland, with special reference to Public Hospitals in Country centres.

We should be glad if you could arrange a suitable time at an early date.

Enclosed please find a short summary of the business which we wish to discuss with you.

Letter from the Home Secretary's Office to Dr. Crawford, President, Australasian Massage Association, dated October 19, 1934.

Referring to your request for a deputation to the Home Secretary, representative of the Australasian Massage Association, for the purpose of discussing the question of extending the treatment of Massage in the various hospitals throughout the State, I have the honour, by direction, to inform you that the provision of Massage treatment is a matter for the Hospital Authorities.

This correspondence would seem to indicate that the orthopaedic surgeons and the Massage Association were not indifferent to the needs of paralysed children of poorer people—but failed in their attempt to secure the co-operation of the Government, which later placed large sums of money at Miss Kenny's disposal.

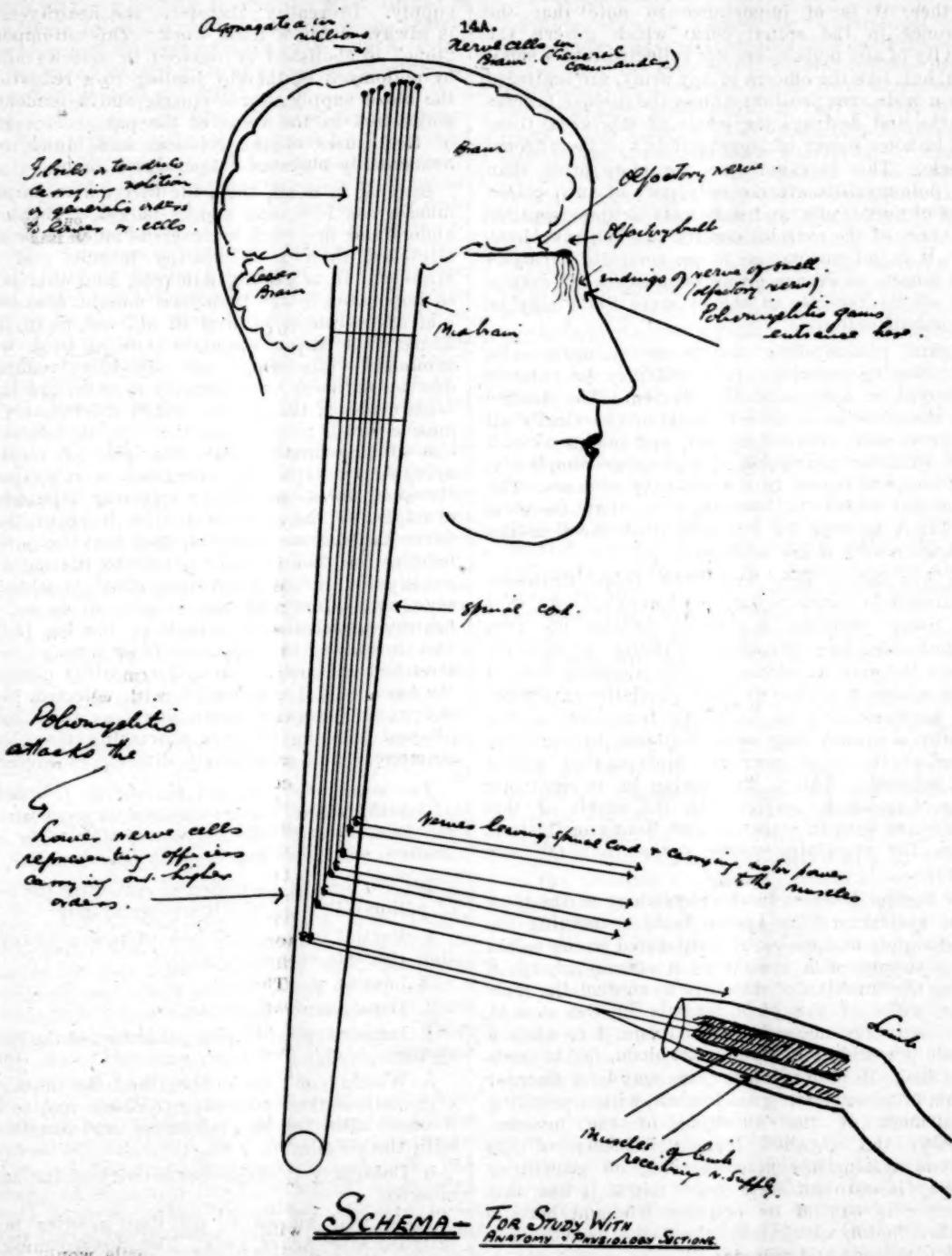
ANATOMY AND PHYSIOLOGY.

To facilitate the understanding of poliomyelitis and its consequences the commission considers that a review of the anatomy of the nervous system on which the disease is superimposed, is necessary. The foundation unit of the nervous system is the nerve cell or neurone. The brain and spinal cord (which latter occupies the spinal canal) consist of aggregations of these neurones clumped together in millions. Different aggregations of such neurones have different functions to perform. The neurones in the brain and spinal cord, with which we wish to deal here, are called the motor neurones, because they subserve the function of inducing muscular contraction, on which all voluntary movement depends. In this connexion it is to be noted that, for the purpose of inducing voluntary muscular activity, the nervous system makes use of two sets of nerve cells (or neurones).

(a) One set, situated in the brain proper, is concerned with the will to set one or more groups of muscles in activity. This set of neurones is called the upper motor neurones. It could be compared with a general of an army giving orders over a telephone wire. The general would represent the nerve cells themselves, and the telephone wire would represent the long fibrils or axones of the upper motor neurones which carry the impulse (representing the general's order) to—

(b) another set of neurones, situated in the lower part of the brain or in the spinal cord, the function of which is to give an order to the muscles to move. This set of neurones would represent the officers passing on the general's orders. These neurones also have long fibrils which leave the spinal cord and connect up with the various muscles of the body (see diagram), and these fibrils would represent the lines of communication whereby the officers see that the higher orders are executed.

The fibrils of these neurones are incorporated in the nerves of the body. Each muscle is composed of innumerable muscle cells, and each of these cells



is connected with a neurone in the spinal cord or brain. Pursuing further the above analogy, one might consider the muscle cells as the soldiers doing the work of the body's movements under higher orders.

It is quite clear that any break in the lines of communication from the neurones of the brain to the muscles will interfere with voluntary movement. Poliomyelitis attacks the lower motor neurones, which above are referred to as the officers.

Further, it is of importance to note that the neurones in the spinal cord, which govern the activity of any muscle, are not collected into a small area, but, like the officers of any army, are scattered over a wide area; so that unless the disease process attacks and destroys the *whole* of this area, there will be some power of movement left in the affected muscle. This is usually so, for more often than not, poliomyelitis attacks only part of such collections of nerve cells, and only mild or imperceptible weakness of the muscles results. In contrast, however, it is not uncommon to see complete paralysis of a muscle or even a group of muscles. Occasionally *all* the muscles of one or more limbs may be put out of action.

Again, poliomyelitis attacks motor nerve cells with varying severity. Any cell may be entirely destroyed or only partially affected. The disease may therefore be so mild that all or practically all the nerve cells affected recover, and muscles which were weak or paralysed, may recover completely. This happens indeed in the majority of cases. The important point to remember is that there is absolutely no hope for a muscle if *all* the neurones connected with it are destroyed.

It has lately been suggested (*vide* Professor Wilkinson in foreword to Miss Kenny's book) that the nerve entering a muscle breaks up into innumerable fine branches, forming a network within the muscle. Some research suggests that in cases where a muscle is only partially paralysed, this network may be of value, inasmuch as the healthy neurones may send impulses through the fibres of the dead neurones incorporated within this network. This is interesting in an anatomic sense, but hardly enters into the ambit of this inquiry, as both in orthodox and Kenny methods it is on the remaining nerve paths that recovery depends.

Of further interest in the physiology of the muscular system are the known facts concerning the blood supply of muscles. Incorporated in the spinal nerve supply of a muscle is a special group of fibres, the function of which is to control the muscular walls of the blood vessels in the muscle. This is a very necessary mechanism, for, when a muscle is working, it needs more blood, *i.e.*, it needs more fuel. In poliomyelitis there may be a disorder of this blood-regulating mechanism, with a resulting impairment of the nutrition of the muscles. Whether the so-called *trophic* influence of the nervous system has much bearing on growth or atrophy is still not very clear; but if it has, this influence is cut off by poliomyelitis and here is another factor which may check the growth of a limb, both bone and muscle.

What is known as muscle *tone* is also of great importance. This means the constant slight contraction which is maintained by all healthy muscles and produces a sense of firmness when felt by the fingers. It depends on the integrity of the nerve

supply. In reality, therefore, the healthy muscle is always doing a little work. This all-important "tone" is abolished or reduced in muscles affected by poliomyelitis, thereby leading to a reduction in the blood supply of the muscle and a tendency to stagnation in the veins of the part. This is one of the causes of the coldness and bluish colour occasionally observed in paralysed limbs.

Bearing in mind, then, the fact that a paralysed muscle has lost tone and is flaccid, it is easy to understand that such a muscle is much more easily stretched than is a healthy muscle. If overstretched, it is grossly damaged, and this is ever so important in the paralysed muscle, because the aim of treatment is, first of all, not to injure it. There is, moreover, abundant evidence to show that prolonged stretching can actually reduce or destroy the power of a healthy muscle, and indubitable evidence that it can retard the recovery of a muscle that is paresed (partially paralysed) so that one of the fundamental principles of treatment accepted by orthopaedic surgeons is relaxation of the weak fibres—usually by splinting. Consider an example: If the muscles in the front of the leg below the knee are paresed, they lose the power of holding the foot at right angles to the leg at the ankle joint, unless a constant effort is made, and even with effort may not be able to do so. The healthy muscles at the back of the leg pull the foot down, and the weakened front muscles become stretched and still weaker. The healthy muscles at the back will, if the condition is neglected, become shortened (adaptive shortening), as their tone is allowed full play. This shortening may become permanent and exceedingly difficult to correct.

Too much stress cannot be laid on this activity of healthy muscles when opposed to weak muscles, for here we have the genesis of deformity which modern treatment has largely abolished.

We are now in a position to epitomize the results of poliomyelitis on the muscular system:

1. Partial or complete loss of power of contraction (paresis or paralysis).
2. Loss of tone.
3. Impairment of circulation.
4. Impairment of trophic influences of the nervous system.
5. Wasting of muscle fibres and the impairment of growth of the limb owing to disuse and to interference with trophic influences and interference with the circulation.
6. Deformity through over-activity of the healthy muscles.

It is well known to all that muscles become fatigued after heavy work. The affected muscle, of course, becomes fatigued much sooner than its healthy counterpart. This is important to remember in treatment. We should bear in mind in this respect that research done years ago shows that in healthy persons fatigue of the nervous system controlling voluntary movement occurs sooner than

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fatigue of the muscles. Indeed the good athlete is more likely to have a perfect motor nervous system than a perfect muscular system. Too much should not be asked of the patient's mental efforts; the nerve centres soon get tired.

Experimental work (Valtat's work on "muscular atrophy in joint diseases", quoted by Jones and Lovett in their text-book on orthopaedic surgery, 1929 edition) has shown that complete immobilization of a healthy limb is followed promptly by some atrophy. This is held as an objection to the use of splinting in cases of paralysis. But the paralysed limb is already rendered immobile by the disease, which latter itself causes most of the atrophy. While it is possible that immobilization by splints or other apparatus may cause slight additional atrophy, this is not usually the case, and professional opinion is undoubtedly in favour of controlled immobilization combined with controlled activity.

While the principal attack of poliomyelitis is on the motor nerve cells, there is in the early stages an affection also of the sensory part of the nervous system; as a result, the muscles affected become very sensitive and cannot be moved without causing considerable pain.

The disease obtains its entry to the nervous system through the nasal cavity, where it first affects the sensory nerves of smell whose terminals are exposed. From this region it traverses the nerve fibres to the main olfactory nerves which join the brain in the region called the hypothalamus. This region is the centre for certain sympathetic controls, disorder of which causes flushing of the skin and sweating, both of which symptoms are frequently observed.

Next in progress the virus passes through the mid-brain where are situated nerve centres controlling movements of the eyes, hence the occasional early symptoms of squinting. The virus then passes down the brain stem, affecting in turn the nerve cells controlling movements of face, jaws, tongue, trunk and limbs. The nerve cells supplying the muscles of the neck and back are distributed throughout the whole length of the spinal cord; it is, therefore, almost inevitable that some of these muscles are affected and become tender. Hence arises one of the early important signs—stiffness of the neck and back.

Further, the virus affects the wrappings of the brain and spinal cord, causing them to become inflamed and filled with fluid. This accounts in part for the headache and stiff back. There is an outpouring of cells into the fluid, which, when withdrawn from the spine by a needle, is seen to be under increased pressure, and its cell content may aid in confirming or disproving an early diagnosis based on the symptoms described. Careful perusal and understanding of the above section of this report is essential before consideration of the following sections. Treatment is based on a knowledge of structure, function and disease.

EPIDEMIOLOGY AND PATHOLOGY OF POLIOMYELITIS.

Poliomyelitis is caused by a virus of ultra-microscopic size which attacks and destroys wholly or partially the cells of the central nervous system, particularly those of the spinal cord which control the voluntary movements of the muscles of the trunk. The muscles most commonly involved are those of the upper and lower extremities. A special feature of the cells of the central nervous system, their complete lack of power to regenerate, is the fundamental physiological and pathological fact in any study of the disease as a whole.

The disease occurs with varying severity from epidemic to epidemic, most often in young children between the ages of one and five years, though no age is immune from attack. There is no doubt that susceptibility decreases with age. No single explanation of this fact is entirely convincing. The theory most widely held at present is that risk of exposure to the infectious agent increases with age and opportunities for contact with cases or carriers of the disease. This is indirectly borne out by the fact, so ably demonstrated by Dr. Aycock, of Boston, one of the world's best authorities on the disease, that the age incidence of the disease is higher in isolated country districts where social contact is relatively less frequent and less prolonged than in urban centres. Aycock graphically demonstrated the close similarity between poliomyelitis on the one hand and measles and diphtheria on the other. It is believed that the opportunities for contact with the infectious agent of the disease eventually produce insusceptibility by causing attacks of the disease so mild that they pass unnoticed and are in fact completely symptomless. Though this theory does not cover all the known facts, it is supported by other valuable statistical evidence. Stocks, an English statistician of high repute, says that immunity to poliomyelitis is undoubtedly widespread in England and explains it theoretically by reference to the Swedish experience, which shows that villages in which only two or three cases were notified during the 1905 epidemic almost invariably escaped the second, 1911-1913, which picked out those districts missed by the first one. His conclusion, based on an analysis of 172 cases, of whom 80% were five years of age or under, is that where the disease is endemic 100 persons acquire an immunity, by mild unrecognized infections, to every one who develops paralytic symptoms, and that by the time adult age is reached the majority of people in an endemic area have thus become immune. In epidemic conditions infection pressure is, of course, unusually high, but it is rare for an epidemic, however intense, to attack more than 5% of any local population. This explanation is held by some not to be a complete interpretation of the facts. In particular, two American workers of unimpeachable prestige, Jungeblut and Schultz, are not prepared to accept it entirely. Jungeblut, who has done an enormous amount of work on the disease, discussing the mechanism of the well-known phenomenon of natural protection, admits that the majority of

children and an even greater number of adults fail to develop paralysis upon exposure to the infectious agent and that certain exceptional children are so highly susceptible that first contact with the virus leads to invasion of the central nervous system. One form of protection, he notes, is that following a paralysing attack, a form of protection, specific in character, nearly absolute in intensity and permanent in duration, which may or may not be accompanied by the presence of circulating antibodies.

The other form is the resistance expressed by complete insusceptibility of certain animal species, all, in fact, except man and possibly some anthropoids, by the varying susceptibility of different human races, or in the individual variations within the same race. It is this form which it is so hard to explain. Jungeblut bases his objections to the subclinical infection theory on three counts, (*a*) the inability to demonstrate clearly such a process of subclinical immunization in either the monkey or man, (*b*) the lack of evidence that virucidal serum and bodily resistance to infection in man and animals are necessarily correlated with previous exposure to the virus, and (*c*) direct experimental evidence that the virucidal substances are more of the nature of vitamins or hormones than of circulating antibodies.

On the issue of this discussion will depend much of our prophylactic work. Schultz quite recently remarked that the differential susceptibility is reflected in the fact that approximately three-fourths of normal young adults in urban communities exhibit indirect evidence of naturally acquired active immunity, though it must be admitted that a demonstration of neutralizing properties in the serum of persons not giving a history of the disease does not necessarily mean that these individuals have really acquired actual immunity to the disease as the result of contact with virus. It must therefore be concluded that the epidemiology of the disease is complicated by the unknown factor of susceptibility.

The disease does not always occur in epidemic form, since sporadic cases are continually being reported and they indicate the constant presence of the virus in the population. Epidemic explosions probably occur when a relatively large susceptible population is exposed to risk. What determines the actual spread of the infection to the susceptible group has never been ascertained, though the presence of widespread host-susceptibility must evidently be one of the factors. The epidemic outbreak of poliomyelitis is usually seasonal, starting in the late spring, rising throughout the summer and falling quickly towards autumn, this rapid fall being probably due to the rapid exhaustion of the susceptible material. Winter epidemics, however, are not unknown, as shown by the present outbreak in Victoria (July, 1937).

Some localities suffer more than others, the difference being no doubt due to the presence of a relatively large population of susceptibles at risk.

The incidence of the disease in epidemic form tends to be very heavy in crowded living areas, and its spread is often along common or busy lines of communication, and is due without doubt to "carriers", apparently healthy persons carrying the virus in an active communicable form, probably in the nasal passages, and passing it on by droplet infection by coughing, sneezing or close bodily proximity while even speaking. There is no evidence of relation of physical characteristics to susceptibility, as is occasionally assumed or suggested. It has been suggested occasionally that individuals of certain physical types or showing certain physical features are more susceptible; but an extremely well-controlled investigation of this matter was made in New York in 1932, and no support for this hypothesis was found.

Since there is no quick, accurate or even practicable method of detecting carriers, and since it is safe to assume that the carrier rate is high during epidemics, the problem of limiting the scope of an outbreak is socially serious and technically very difficult. W. H. Park, one of the world's most distinguished hygienists, with Maurice Brodie, in an experimental investigation of the chance of securing an efficient prophylactic, having the simplicity, safety and efficiency of anti-diphtheria toxoid, states that isolation of contact cases in poliomyelitis cannot be effective because of the probably high carrier rate. This calls in question the value of isolation and quarantine generally, since those measures are the ones most frequently used against infectious disease. Judging by the incidence and mortality of diphtheria before the use of toxoid or other efficient prophylactic, these methods were a failure. It has been shown, moreover, by carefully controlled statistical work on an English scarlatina epidemic that isolation and similar usual measures actually gave poorer results than no such restrictions at all. So that those who advocate restriction of movement of suspect carriers or contacts incur a heavy responsibility. Other paths of infections besides carrier contact have been incriminated. Aycock has attempted to show that it may be conveyed by milk, as in two New York State epidemics and in one in England, and other ports of entry to the body besides the nasal tract have been investigated. For the most part, we may assume with confidence that the disease is conveyed by droplet infection by way of the nose and throat. From there the virus travels to the forebrain and thence to the other parts of the central nervous system by the nerve cells and their extensions and in no other way.

It is important to grasp this fact clearly, as it has the deciding influence on treatment of the immediate symptoms and on the sequelæ of an attack.

"Viruses", says Peyton Rous, "produce disease through an intimate association with tissue cells. Cells, not the animal body, are the true hosts of the viruses, fostering and even protecting them." The virus of poliomyelitis is, as Schultz points out and as has been amply demonstrated by Hurst and

Fairbrother, a true neurotrope, that is, it exists and produces its characteristic effect only in association with nerve cells. It normally gains admission to the central nervous system by the olfactory nerves. The virus then travels from one level of the nervous system to another largely or entirely by axonal paths, probably inside the neurones and therefore essentially outside the reach of circulating antibodies. Amongst other effects, the essential one is destruction of nerve cells and their fibres, particularly in certain parts of the spinal cord, where commonly from one-half to two-thirds of the anterior horn cells may be destroyed. Sometimes a still greater proportion or even almost the whole of the anterior horn cells may be irreparably damaged. In cases like that death may be incredibly rapid. There is at present no ascertainable reason for the particular distribution of the virus in that portion of the cord which is so closely and indeed essentially associated with the action of the skeletal muscles. Besides the nerve cell destruction there is in the affected part of the cord or brain, a distension of the tissues with a mass of cells and dropsical fluid, which will exercise considerable pressure on cells not affected directly by the virus. The result will be complete and permanent paralysis of the muscles connected to the destroyed nerve cells, which never regenerate. The site of the destroyed cells is filled in by a fibrous-like mass of cells derived from the supporting tissues of the spinal cord; but function temporarily lost by muscles supplied from those nerve cells not destroyed but suffering suspended function by pressure will be regained. These pathological conceptions can be laid down as fundamental and as the only basis of our knowledge of the disease, so that it is idle to speak of and futile to expect cure of infantile paralysis, that is, the restoration of function to a muscle supplied with motor nerves from destroyed neurones. Wherever restoration of function has been observed in an apparently paralysed limb, we may be quite certain that the nerve supply and central connexions are intact.

These pathological considerations are also of importance in connexion with the vexed question of immediate specific treatment of the acute attack. In many quarters favourable reports have been issued on the use of "convalescent serum" in acute poliomyelitis. In view, however, of the conflicting reports from the most important world centres of research and of the very strong opposition to its use by the best authorities, judgement on the issue was suspended. One of us (Dr. J. V. Duhig) made special inquiry abroad into this aspect of the poliomyelitis problem, and we here record the thanks of this commission for the invaluable help and courtesy which Dr. Duhig received from Dr. W. H. Park, Director of the Bureau of Laboratories of the New York City Health Department, and Professor Schultz, Professor of Bacteriology, Stanford University, California, both unrivalled authorities on all aspects of the disease. Dr. Park has preeminent claim to special knowledge on the epidemiology and

treatment of the acute disease, and Professor Schultz on the experimental side. Both unconditionally condemn and entirely reject the use of convalescent serum. Dr. Park believes it is not only useless, but also, when given into the spinal canal, dangerous. As Dr. Aycock, another celebrated authority, was not in Boston when Dr. Duhig visited that city, Dr. Park was asked to secure Dr. Aycock's opinion. He reported that Dr. Aycock was one of the last to have any faith in convalescent serum and had now completely given it up. Convalescent serum is not now used in any important medical centre in the United States of America. The principle of serum therapy is completely fallacious, while the use of serum intraspinally stultifies all we know of the pathology of the disease.

Schultz says (1936): "the virus is probably inside neurones and therefore essentially out of reach of circulating antibodies". If that is true in respect of alleged anti-substances injected directly into the blood, it has all the more force in respect of substances injected into the spinal canal and completely incapable of penetrating through dense layers of tissue to the infected neurones.

In the only properly controlled series of tests, those reported by Park and by Kramer and Aycock, the results were that in Park's series "statistically there is certainly no evidence that the serum did any good"; and in Kramer and Aycock's series that they "failed to obtain statistical evidence that convalescent serum is effective". The only large series about which there have been published reports in Australia had no untreated controls to compare with the treated patients.

Jungeblut (1937) commits himself to the categorical assertion that specific means of therapy through convalescent or immune serum has failed, experimentally as well as clinically.

Brodie and Park state definitely that "serum therapy is of no benefit because the disease is confined solely to the central nervous system". The fundamental fallacy of attempts to prove the efficacy of convalescent serum is the application of conceptions of bacterial disease of extranervous tissue to virus infections within the nerve cells, between which there is no such simple analogy as is implied in those attempts if there is even the remotest one at all. A common type of fallacious experiment is that reported in *The Lancet* recently in connexion with a review of the use of serum in the Danish epidemic of 1934.

In this experiment, virucidal serum is mixed with virus and the mixture inoculated into monkeys, when no disease develops. This simply proves that neutralized virus will not infect. Schultz has supplied the answer to such a faulty basis for the opinion that virucidal serum may be of value. He says:

Once the virus is established within the portal of entry, it continues to be out of reach of humoral antibodies. This is evidenced by the fact that a very large dose of highly active immune serum administered as early as two days after intranasal inoculation does not in any way alter the course of an experimental infection.

The conclusion of all workers is that the presence of humoral antibodies is largely irrelevant, being merely a reflection of the fact that the nerve cells have been exposed to the action of the virus. They are a by-product. Jungeblut has confirmed this by an ingenious series of experiments, which showed that insusceptibility to infection in monkeys convalescing from a paralysing attack was in no way related to the presence or absence of virucidal substances in the serum. Another experiment showed that an animal which had passed through a cycle of fever after inoculation, but without paralysis, was fully susceptible of infection. Quite obviously immunity is cellular, not humoral, that is, the resistance to attack is a function of the nerve cell and not of substances in the blood stream.

Protection from poliomyelitis depends on a previous paralysing attack or insusceptible nerve cells; the virucidal power of the serum is irrelevant. Attempts to produce a prophylactic against the disease have proved so far unsuccessful, though it has been shown that children who have been vaccinated against smallpox are not attacked by poliomyelitis to the same extent as the unvaccinated, and that monkeys artificially infected with non-fatal dog distemper cannot be infected with poliomyelitis to anything like the same extent as unaffected control animals.

Suggestions, however, for indirect protection by modifying with chemical substances the portal of entry of the virus have been widely made. Out of forty substances tested by Professor Schultz, one was found to give promising results in monkeys and to be worth at least some trial in man; 1% solution of zinc sulphate did confer protection on the animals against an artificial infection. But the technical and practical difficulties render its use almost impracticable. In order to be effective, the agent must be applied to the olfactory membrane, and this can be done only by a person with a high degree of skill and experience. The proper result cannot be secured by self-administration with an ordinary hand atomizer. The only way in which the treatment could be practically useful in an epidemic is to confine its use to actual contacts of a case in the hands of a nasal medical specialist or specially trained medical man. An agent which requires such skill and which has to be applied on two or three successive days and then fortnightly thereafter all through an epidemic is obviously out of the question for mass use, apart from any risk to the person sprayed. The matter is still being investigated.

CLINICAL PICTURE.

The clinical picture of patients suffering from the effects of fully developed infantile paralysis needs only brief description. As the result of the illness the patient is paralysed in one or more limbs. Thus paralysis is established at its maximum within one to seven days after the acute attack, the amount of permanent paralysis being very variable and difficult to forecast. Resulting from the

paralysis a varying amount of deformity may be established later on. Paralysis of one or other limb may of course result from other causes, but the differential diagnosis always remains a matter for professional advice.

In recent years, however, it has been possible in a number of cases for medical men to detect the disease before the onset of paralysis. It is these signs and symptoms which we as a commission consider to be of sufficient interest to the lay public to merit further description. Three types may be indicated.

First, the onset of the disease is usually sudden, the temperature rising to about 100° to 103° F. and lasting for two or three days. During this feverish period the skin has a flushed or pink appearance and is inclined to be moist. There are all the signs of any acute feverish illness, headache, vomiting and lack of appetite *et cetera*. The child is often drowsy or delirious, and complains of severe pains in the back and limbs. Constipation or retention of urine is the rule. Convulsions may occur, but are not common. The patient resents interference and wishes to be left alone in its misery. The picture is akin to that of dengue fever. Rigidity of the back is frequently observed, and, when asked to sit up, the patient proceeds to grasp the side of the cot and struggles up sideways, keeping the back and neck as rigid as possible.

As he turns to get into a sitting posture he places his hands behind him and thus balances himself on his buttocks and hands, with his body leaning backwards—the "tripod posture" of the so-called "Amoss sign". He is not able to put his chin on his chest nor to bend forward and kiss his knees. These symptoms or signs last two to three days, and the time is spoken of as the preparalytic stage. During the next twenty-four hours paralysis supervenes.

Secondly, the "dromedary type" is sometimes encountered. Here the signs and symptoms are those of any acute feverish condition—much the same as the foregoing, but lasting only about forty-eight hours; the temperature drops and the patient feels a great deal better. Two to four days later, however, a second rise of temperature occurs, with signs of brain irritation, followed quickly by paralysis.

Thirdly, among the sporadic cases, that is to say, cases occurring at any time and anywhere as contrasted with those occurring during an epidemic, the patient may exhibit quite characteristic features, as already described. In a number of those cases, however, the child, without any warning symptoms or illness preceding, wakes up with paralysis fully developed in one or more limbs.

It should be stressed that in every type the paralysis is maximal early in the disease and that, quite apart from any form of treatment, a varying degree of recovery takes place—sometimes complete recovery. In other cases, however, the damage to the spinal cord is so extensive that there is permanent loss of power in muscles by this damaged portion of the cord.

TREATMENT.

Having thus considered carefully the anatomy, physiology, pathology and clinical picture of the disease, the following section on treatment will be easily understood, and it will be seen that the accepted method of treatment follows logical conclusions.

In the early stages the patient is usually a very sick child and not easily nursed by parents. There are two aspects to be considered: the patient and the community. Taking the latter first, we know too little of the process of infection to countenance any risks. Every patient must be isolated for a term of three weeks. This practically prohibits home nursing, except by the comparatively wealthy. Day and night nursing is required, and the isolation of the household must be rigidly enforced. The patient's interest is best served in a hospital.

From the onset of the paralysis the orthopaedic surgeon must exercise continuous supervision of the patient. There is nearly always, at the onset, tenderness of the affected muscle; this varies greatly in intensity and duration. In the Brisbane epidemic of 1931-1932, it was in some cases absent or so transient as to pass unobserved. In this initial stage the essential factor of treatment is complete physiological rest, mental as well as physical. Parents and visitors are excluded in an attempt to avoid any form of stimulation or irritation.

Apart from maintaining the patient in as good a hygienic and physical state as possible, there is no specific treatment known which can influence the course of the disease once established in the central nervous system. Careful observation, however, over many years has taught us that painstaking nursing of the muscles affected is necessary to prevent the stretching and deformities upon which stress has been placed in the section on anatomy. The same observations have taught us that, when the storm of the acute disease is over, the weak muscles can be strengthened by what is known as reeducation.

The principles, therefore, involved in the orthopaedic treatment will be:

1. The avoidance of further damage to affected muscles by stretching.
2. Avoidance of deformity caused by over-action of healthy muscles.

3. Avoidance of fatigue in damaged muscles.

4. Judicious reeducation, administered by one trained in anatomy, the purpose of this reeducation being to strengthen the muscles, with the strictest adherence to desiderata 1, 2 and 3, and to maintain proper muscular balance, avoiding over-use of healthy muscles at the expense of weak ones, i.e., avoiding trick movements.

5. Maintenance of a good blood circulation in the affected limb, and in particular the avoidance of any measures that will constrict or impede the circulation.

Some patients at the onset of anterior poliomyelitis are in a severely toxic state, and in these absolute rest and freedom from unnecessary distur-

bance is indicated. Sand bags can be used to support the limbs and keep the body straight. If the condition in these cases improves sufficiently, and in all cases where the condition warrants it, prompt splinting is indicated. At this stage the likely extent of paralysis is not known, and it is best to splint extensively. The best form of splint, in our opinion, is a non-padded plaster cast moulded to the child's back and lower limbs. For the upper limbs, padded frame splints may be used while the child is recumbent. The posture aimed at is one which will avoid the commonest deformities and keep the limbs in a comfortable position of rest. The posture generally used at this stage is: (i) Arms at 90° at shoulder joints with elbows at 90° and forearms in supination, hands dorsiflexed at wrist, with fingers slightly flexed at all joints, and thumbs extended and slightly opposed, as in gripping a large object. The trunk is, of course, kept straight, and the lower limbs in extension at about 10° to 15° of abduction at hip joints with no rotation. The knees are flexed about 10°, and the feet are kept at 90° at the ankle joints, and neither inverted nor everted. It is best to avoid a general anaesthetic, if possible, to apply the cast, but if great muscle tenderness is present and the child's general condition will warrant it, a general anaesthetic should be given. This may seem a severe measure. The application of the cast is, however, of such vital importance in the prevention of deformity that, where necessary, the anaesthetic is worth while. The cast does not encircle the trunk or limbs, and is open in front and not bandaged. This avoids constriction of the limbs and consequent interference with the circulation.

As soon as muscle tenderness subsides and the limbs can be handled without pain, the extent of the paralysis is gauged and muscle reeducation commenced and carried out twice daily if possible. The limbs and trunk are put through their full range of movement to prevent stiffness of joints. This is a routine measure. Where no muscle tenderness is observed, reeducation should be commenced as soon as the child is well enough. If the limbs are cold, preliminary heating by hot-water bottles, diathermy, inductotherapy or radiant heat is carried out before each reeducation treatment.

Light stroking massage with warm hands is comforting to the patient and is of some value to the damaged muscles, in that it improves the circulation of the part. It is, however, not the principal aim of the attendant in this disease. Although the attendant is usually known as a masseur (or massense), the specific treatment is *not massage*, but reeducation, the essence of which is to cause the patient to exercise each recovering muscle just short of fatigue. If a muscle is fatigued it will retrogress in power instead of progressing. The reeducator keeps in mind not only the weak muscles to be built up, but also the damaged nerve connexions in the spinal cord. Concentration of direction on the reeducator's part, and of effort on the patient's part, make full use of the nerve paths that

are still capable of letting an impulse through. Indeed, it has been suggested that sufficient concentration on the patient's part will open up new paths and nerve connexions. This is a very doubtful point, and at present pure hypothesis. It will readily be seen that the part of a reeducator is no easy one to fulfil, and demands an effort of great intensity with a background of thorough training.

All the muscles of the body are exercised except those which are opponents of paralysed muscles; exercising such opponents (except just sufficiently to maintain tone) is likely to do harm by stretching the paralysed muscles. When possible, especially in young children, the exercises are made purposive and interesting, so as to avoid the ennui produced by monotony. A bright outlook in reeducator and patient is a great help in recovery. In attempting to reeducate completely paralysed muscles the patient is induced to concentrate on the movement being attempted, while the reeducator carries out the movement passively.

Splinting may have to be altered as different groups of muscles recover, so as to favour the recovering muscles and *not* those which have recovered or have not been affected. The attending surgeon will order such changes in splinting. This is one of the reasons why the surgeon tests the muscle power at frequent intervals, ever on the watch to take advantage of any improvements and to nurse weak muscles. He and the reeducator will also keep a constant look-out for insidiously commencing deformity. It should always be remembered that deformities, especially spinal deformities, can develop quickly and quite early in the disease, even while the patient is in bed.

Electrical stimulation of muscles has no place in present-day treatment. It is of no service and unless in very skilled hands can be harmful. When muscles have sufficiently recovered, splinting is abandoned for a gradually increasing period daily, and the effect carefully watched. If no ill-effect results, full use of the muscles, including ambulation, is allowed for gradually increasing periods daily. Exercises are continued and the patient is carefully examined at frequent intervals for signs of early deformity.

Every patient should be kept under observation for at least a year, and preferably two years. If, after two years of splinting and reeducation, residual paralysis is present and no recovery has been noted during the previous six months, it is presumed that the paralysis present is permanent. Ambulation may now be allowed with the help of appropriate supporting splints; if there is a tendency to the development of any particular deformity, this is guarded against by such splinting, and night splints may also be necessary.

The question of operative treatment such as tendon transplantation or stabilizing operations is now considered.

The aim of the orthopaedic surgeon is to avoid permanent splinting, but in cases where operative treatment is not likely to achieve this result, it is better to persist with splinting than to allow dis-

abling deformities or paralytic dislocations to develop. This point needs stressing. Permanent splinting, in other words, is used in certain cases because nothing better is available.

The patient's ordinary education (and in older patients, vocational training) is attended to throughout treatment.

A further reference is now necessary to reeducation. It is an art which has been brought to a high degree of development and achievement, and only a skeleton outline of it could be given on paper. To help the reader understand some of its intricacies, we have appended from a practising masseuse a description of a half-hour's reeducation of a paresed muscle group in the front of the leg (*i.e.*, below the knee joint). (See appendix.)

Usually the reeducator works with the limb supported on a polished table or board, or in the hand. Very weak muscles are not asked to work against the force of gravity, and the reeducator knows how to get gravity to assist a weak muscle in its work. The polished board minimizes friction and so greatly helps certain movements.

It has long been known, of course, that a limb immersed in water and relieved from the pull of gravity needs the minimum of muscle power for executing movements. Indeed, a paresed muscle may be able to execute *visible* work under water in certain postures and unable to do so on the board. Such an achievement must be encouraging to the patient and, if judiciously handled, beneficial to the affected muscle group. In addition, the water has a slight stimulating effect on the circulation. Under-water reeducation has therefore been introduced into many clinics, and is particularly beneficial for very weak muscle groups. Many contend that they can produce as good results on the polished board, but, if it is granted that the under-water method has any advantage whatever, then it should be available in all clinics.

Some authorities say there is no special advantage in the use of under-water movements in reeducation. As Dr. Meehan pointed out in evidence, Lohmann has been using under-water therapy for about twenty years; and though he claims to get good results, other authorities have not been so impressed as to make similar practice universal. A skilled reeducator can so make use of gravity on the board or table as to eliminate all its antagonistic effects and even to make use of it, though perhaps with less convenience than is experienced under water, in some instances.

In later stages of the disease swimming and bicycle pedalling are used for certain muscle groups, and other forms of gymnastic exercises may be used.

The most difficult of the reeducator's work is perhaps the work on weak spinal muscles. Here a high degree of anatomic knowledge is necessary. Indeed, in the most competent hands the treatment of spinal paresis is often very disappointing. The spinal column is a difficult unit to splint, so that spinal deformities are in fact hard to prevent. It is quite certain, however, that any system of

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treating poliomyelitis that disregards the use of immobilization will reap a harvest of spinal deformities such as have not been seen since the days when the disease was treated on less logical lines.

Before concluding this section on orthopaedic treatment, it is well to draw attention to the alleged bad effects of immobilization of paresed or paralysed muscles. In the system of treatment here described, immobilization is regarded as *essential*, and its omission therefore damaging, if not disastrous. Most cases of acute poliomyelitis are kept at *continuous* rest in their splints or casts for only two weeks at the most. This early conservative neglect is rendered imperative by the soreness and pain. Experience shows that no joint stiffness results from this early delay in commencing joint movements and reeducation. (Jones and Lovett, Edition 1929, page 434.)

Perusal of Miss Kenny's book and the two forewords (written by Professor Wilkinson and Dr. Guinane) indicates that, at least by some, it is thought that orthodox treatment wraps limbs up in splints and neglects them for long periods of time, and that incalculable damage is thereby caused.

The commission finds that as far as relates to Queensland practice this allegation (or assumption) is wrong. The system of treatment that would countenance such a procedure would be condemned by all experts of the last two decades.

The treatment of the neglected case of poliomyelitis (the chronic case) presents more difficulties than the acute case. Deformities have generally occurred, and weak muscles have been stretched and made weaker. Nevertheless the chronic case often reacts to treatment in a way that is most gratifying to the surgeon and attendant. The number of years that have elapsed since the paralysis occurred is no deterrent to the surgeon in these cases. When the deformities have been corrected by manipulation, splinting, or by operative means (where other methods fail), the case is treated on exactly the same lines as the acute case. The same principles apply. The most neglected case generally improves with proper attention.

Sir Robert Jones refers to a case of thirty years' duration. In a few weeks the *gluteus medius* muscle more than doubled its contractile strength by careful muscle training and restriction of activity.

A description of the methods used in correcting deformities hardly comes within the ambit of this inquiry. To see a deformity that has existed for years, corrected by non-operative procedures is a thrill that only those treating such cases could enjoy.

The system of treatment outlined above is that which has been practised in this State for some years past. It is in substance the treatment practised by specialists in English-speaking clinics throughout the world. The commission, after much inquiry at home and abroad, is convinced that the principles of treatment above enumerated are sound and, in the light of present-day knowledge, it is

convinced that any departure from these principles is dangerous.

THE KENNY METHOD OF TREATMENT.

Miss Kenny lays down five principles in treatment:

1. Maintenance of a bright mental outlook.
2. Maintenance of impulse.
3. Hydrotherapy and remedial exercises.
4. Maintenance of circulation.
5. Avoidance of the generally accepted methods of immobilization.

These fundamentals of the Kenny method need discussion. With regard to 1, little need be said. Miss Kenny is to be commended for stressing a point which is practised in the therapeutic departments of all hospitals. The commission considers that the so-called orthodox clinics have little to learn in this respect.

By "maintenance of impulse" Miss Kenny apparently means the maintenance of the nervous impulse to the muscles from the brain centres. There is a new term here, but not a new idea. The aim of all reeducation is the fullest possible use of all the available remaining nerve paths to the affected muscles. The commission considers that asking the patient to visualize the part to be moved is a good idea and of real value. It, of course, has its limitations, because very young patients are incapable of "visualizing", and the majority of the patients are very young. (See the practising masseuse's report, and compare this visualization with the equally sensible instruction to the patient to move the sound limb with the weak one—appendix.)

In the use of hydrotherapy or under-water treatment the commission concurs, but only within reasonable limits. As routine practice it is entirely unnecessary in many cases and would add much to the time and cost of treatment. Miss Kenny lays great stress on the importance of the individual bath. This is indeed reasonable, but under modern methods of pool control, the small bathing pool into which only the patient and the reeducator go, is much the same thing. In a pool, moreover, there is more scope for full range of all muscle group movements, owing to the greater depth of the pool. In American and European centres much money has been expended on suitable individual and communal pools. Australia might well imitate such examples. Under-water therapy is of course no new idea. It has been used in reeducation for many years past, and competent authorities are not agreed as to its importance.

The maintenance of a good circulation is stressed by Miss Kenny, and of course, as will have been noted in the foregoing sections of this report, she agrees herein with orthodox opinion. This has been a surgical principle applicable to injured or diseased limbs for at least half a century, although active means, such as massage, to stimulate the circulation, are only a later development.

Under modern methods of treatment of poliomyelitis there is nothing detrimental to the circulation as is suggested by Miss Kenny (*vide* page 8 of Miss Kenny's book, "Infantile Paralysis and Cere-

bral Diplegia", also on page 11). Miss Kenny considers that *immobilization* reduces the vitality of the circulation to such an extent that it should be abandoned. The commission does not agree that in properly applied shell casts or in splints or frames the circulation is impaired. This is particularly true in a paresed limb, which lies inert and flabby whether in a splint or not, and in which the circulation is naturally far from good. This leads us to consider Miss Kenny's fifth principle, which is certainly revolutionary, but we consider in a retrograde direction, namely, "the avoidance of generally accepted methods of immobilization". Note the term "generally accepted", for these methods have been accepted in practically every progressive clinic in English-speaking countries.

Immobilization, which has been freely discussed in the preceding section of this report is, with reeducation, the *kernel* of the modern treatment of poliomyelitis. Certainly, if orthopaedic surgeons were to employ the method of immobilization and neglect which Miss Kenny and others consider they use (see frequent references to this in Miss Kenny's book), then Miss Kenny's avoidance of it would be comprehensible. Miss Kenny's concept of immobilization is a state in which "day in and day out the limb is motionless".

The commission knows of no clinic in which this tragic method is used, and finds it difficult to understand that Miss Kenny should have such a conception. Miss Kenny raises psychological, physical and physiological reasons against those "generally accepted methods of immobilization"; but none of her arguments is convincing, nor do the results achieved by the Kenny method lead the commission to consider that these methods should be abandoned. The position is, moreover, somewhat illogical, for although Miss Kenny declares her work is intended to be a "better service for the medical profession", which has to be carried out under a doctor's supervision, she includes among the "general principles of treatment" the "avoidance of generally accepted methods of immobilization" (page 13 and 14). This curiously in spite of the fact that the very authorities she quotes—McKenzie, Jones, Lovett—are the strongest protagonists of these accepted methods.

The commission was very interested in the fact that under Miss Kenny's method of treating this disease, *deformities* due to contractures have not been observed as frequently as might have been expected. This is due to the frequency with which she and her staff perform the daily joint movements. Without splints this frequency of treatment is necessary to prevent contractures. Miss Kenny is fortunate in having a staff large enough to carry out such manœuvres. Even such attention, however, will not prevent the development of severe deformities in spinal and abdominal pareses where splinting is abandoned. It is quite certain, too, that the Kenny method of treatment, which avoids splinting and so allows muscle stretching, would encourage much more deformity than the orthodox

method in those cases that have to *leave the clinic uncured*. Without the application of some apparatus to support weak against normal muscles, deformity due to stretching and contracture must eventually occur in such cases. Nothing need be added to what has already been said in the section on orthopaedic treatment on the loss of muscle power caused by stretching a weak muscle. This loss is unavoidable where splints of some kind are not used.

Miss Kenny's views regarding the use of calipers are very confused. After roundly condemning their use on account of the evil results depicted in her text-book (page 19) she approaches the views of orthopaedic surgeons when she states that "all possible power should be restored before calipers are used".

In spite of this dictum, however, Miss Kenny now directs that calipers be used in some of the cases actually attending the clinic for treatment. The commission has observed that on this question, as well as in other details, Sister Kenny's treatment has undergone a gradual but distinct change towards orthodox methods.

It must be admitted that even with the application of walking irons, calipers or spinal jackets, the surgeon not infrequently has the chagrin of seeing contractures develop in uncured severe cases, but he knows that with their aid he can keep the deformities at a minimum and that many cases will never walk without them. There can be no doubt about the truth of this assertion, and the commission wishes to stress it.

With regard to principle 4, the Kenny Clinic method of reeducation is *now* nearly the same as orthodox methods in use for many years. There is no mention in the text-book of "vibratory massage", described by Dr. Dungan and approved by Miss Kenny (September 7, 1934). There is no mention now of the forcible grip which so impressed Dr. Crawford, Sir Raphael Cilento and Dr. Dungan.

The exercises described for training of individual muscles and of muscle groups are practically the same as those used in orthodox practice for many years. The number of movements is, however, limited by Miss Kenny to three per session, except at the bath session, when six movements are used. The commission sees no virtue in this arbitrary number; very good results are achieved by orthodox practice, where the number of movements may, in certain cases, be greatly extended provided fatigue is avoided. In an important point the Kenny method as described in the text-book is faulty; there is no instruction to avoid lengthening of the weak muscle fibres. This is a serious fault.

The use of hot and cold sprays, it is contended, improves the circulation in affected limbs. There is no doubt this is true. Such a method is beneficial in the same way as radiant heat, diathermy or massage, especially in out-patient practice, where the patient has not, in winter time, the advantage of a warm bed before treatment. But, as already

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stated, if made routine practice the spray bath would be in many cases a waste of time and effort. The under-water exercises are, let us repeat, in certain cases advantageous, but are nothing new.

Miss Kenny treats the acute cases six times a day, giving each muscle on the average three contractions per treatment according to her text-book.

According to Miss Kenny's evidence before the Royal Commission, however, "they get the full treatment in the morning and in the full treatment each movement is repeated three times. At the next treatment it would be repeated perhaps once, and the same later in the day" (we take it this means once later in the day), so that the Royal Commission is not aware exactly what procedure is followed in acute cases. She also puts joints in the affected limbs through some range of movement six times per day. While the staff is available to execute such a large number of attendances, we agree that the idea is good; but excellent results have been produced in the past with two treatments per day, to a point short of fatigue, which point is left to the reeducator's judgement. Good results have been produced where only one treatment a day is given. Such single or double treatments in orthodox clinics last from 20 to 40 minutes (depending on the number of muscles paralysed).

The commission has evidence that patients in the last epidemic could have received more reeducative treatment at the peak period of the epidemic, when all available hands were working at top pressure. This is not liable to happen in future, now that the Government and the public have become "paralysis-conscious", so that no means, financial or economic, will be spared to secure sufficient staff.

The clinic exercises for spinal paresis are meagre and show a poor understanding of the anatomy and pathology of spinal deformities. The commission considers that the Kenny methods of correcting spinal and other contractures are inferior to the well-established orthodox methods.

As Sir Robert Jones stressed years ago, contractures give way most surely to constant corrective stress and very reluctantly to intermittent corrective force.

As non-operative correction of deformity is always preferable to operative reduction, Miss Kenny would be well advised to introduce some of the well-established correcting measures into her system. Miss Kenny described to the commission her "equipments" for the purpose of correcting such deformities. We consider them inefficient. This applies particularly to equipment No. 1, which is useless, less so to equipment No. 2, and still less so to equipment No. 3. The latter equipment, however, used for correcting contracture of the *tendo Achillis*, is dangerous where there is any knock-knee or bow-leg present, for it would surely tend to increase the deformity.

The clinic "artificial buttock" is of interest. Miss Kenny claims that many curvatures of the spine are due to wasted buttocks. This is indeed sometimes true. When one buttock is wasted the pelvis

tilts and a compensatory curve in the spine develops. Miss Kenny's artificial buttock corrects this. Such compensatory curvatures, however, do not become fixed. Severe and disabling spinal curvature is always due to spinal or abdominal muscle weakness. This "artificial buttock", however, does serve a limited field of usefulness in the sitting posture where a wasted buttock is responsible for a compensatory curve. Severe and disabling spinal curvature is always due to spinal or abdominal muscle weakness.

The commission finds that other of Miss Kenny's apparatus are ingenious and useful. Her pulleys for treatment of spinal curvature and extensor paresis should find a field of usefulness in orthodox practice. Her apparatus for measuring power of thrust in lower limbs should prove of value. Reference is necessary to her apparatus for preventing drop-foot, which seems cumbersome and which should be replaced with the orthodox wooden or plaster back splint.

Miss Kenny admits that she has not had much experience in acute cases. Nevertheless she lays down rules governing the treatment of acute cases. It will have been seen that the orthopaedic surgeon does not commence joint movement until all pain and tenderness have disappeared (*i.e.*, from one to fourteen days after the onset). Experience shows that no joint stiffness occurs, as mentioned before. Miss Kenny puts all joints through some range of movement at least once daily in the stage of tenderness. There is surely no need to do this when there is tenderness present. Robert Jones's dictum, that no healthy joint will become irreparably stiff through immobilization, applies to infantile paralysis.

Miss Kenny claims that her method is superior to the orthodox in the treatment of the earliest stages of the disease. Her statement that early and frequent movement remedies the muscle pain is of interest, and if confirmed may warrant some modification of present-day nursing methods at that stage of the disease. But the commission is agreed that no significant advance in the treatment of poliomyelitis can result from any change in the methods of reeducation used in the very early stages. It must be again stressed that the muscle damage is only secondary to that caused by the virus at the real sites of the disease, the brain and especially the spinal cord. Early treatment of the muscles cannot possibly minimize the actual paralysis. Any relief in this regard must come from an attack on the virus, before it has been able to destroy any nerve cells. This is the task of the bacteriologist, biochemist and physician—never the task of the orthopaedic surgeon or physiotherapist.

We are now in a position to sum up this discussion of the Kenny method of treatment of poliomyelitis.

1. The abandonment of immobilization is a grievous error and fraught with great danger, especially in very young children who cannot cooperate in reeducation.

2. The Kenny system of reeducation is partially efficient, its efficiency being marred by Miss Kenny's failure to recognize the dangers of muscle stretching or lengthening—a serious fault.

3. The Kenny method of treating contractures is not nearly as efficient as other well-established methods, well tested by experience.

4. The organization of Miss Kenny's clinic is admirable. No money is spared in providing her institution with necessary apparatus and staff, which latter practise assiduously her methods.

5. It would be particularly damaging to adopt the Kenny non-splinting method of treating early cases, owing to its failure to prevent injury due to muscle stretching and deformity due to muscular imbalance.

CEREBRAL DIPLEGIA.

Without entering into any detailed description of this condition, the commission wishes to point out that under this title may be found a large number of cases in which there is evidence of a bilateral affection of the brain, and cases which have an entirely distinct causation and pathology are brought into a single group.

Some are due to arrested development or infective processes before birth—pre-natal. Some are caused by intracranial haemorrhages at birth—natal—or commonly known as birth injuries, whilst others—post-natal—are of infective origin or sequelæ to some brain damage.

Four clinical types may be enumerated:

(i) Congenital spastic paralysis needs no description beyond stating that mental deficiency of greater or less severity is present in all cases and abnormal movements, choreo-atetosis, do not occur.

(ii) Bilateral hemiplegia. All four limbs are spastic, but the degree of paralysis is never symmetrical; one half of the body is more affected than the other. In a large number of these cases atetosis or choreiform movements appear as the child develops. The involuntary movements affect the limbs chiefly, arms more than the legs, but facial grimacing and difficulty in articulating are also common. The mental state in this as compared with the former is relatively less damaged. It is more often a result of physical handicaps than a genuine mental deterioration.

(iii) Atonic diplegia is rare; and lastly

(iv) Cerebellar diplegia. Neither (iii) nor (iv) was seen at the clinic.

Prognosis.

Trying to forecast the future in these cases is indeed difficult. Many things must be taken into account—an accurate birth history, the degree of spasticity, the size and growth of the cranium, whether there are recurrent convulsions, how far the mental processes seem to be affected originally and the extent to which they have already improved.

It should never be forgotten that there is another thing which keeps those children back. The uselessness of their limbs and the very poor control they

have over them and their bodies are a serious handicap to their intellectual development, for they miss the useful stimulus to thinking which comes from crawling about the house and feeling and handling everything that comes within their reach. Thus learning by experience as does a normal infant is denied them. This lack of experience is bound to keep them back, and they often appear to be less intelligent than they afterwards turn out to be.

Too often in the past these children have been labelled hopeless idiots and denied education *et cetera*, which, if given with care and patience, would have produced results: results that would have not only confounded their original prognosticator, but also surprised him.

Nevertheless it must be clearly understood that these children will never be normal; all their lives they will be handicapped by the spastic state of their muscles, however good their mental powers may be.

The commission would like to stress the point that most "spastic" children do improve with age apart from any treatment whatever. This improvement is manifested both in intelligence and muscular function.

Treatment.

In her book "Infantile Paralysis and Cerebral Diplegia", page 108, Miss Kenny states: "the management of Cerebral Diplegia is a long and tedious process requiring immense patience and care". Nothing truer has ever been said, and that is the crux of the whole situation.

There are very few people in this country who could afford private treatment over the long years that are necessary to improve those unfortunate children.

Many parents have spent large amounts of money on such cases in their first few years of life, only to see the improvement gained by reeducation slip back when funds become depleted.

So also our public hospitals—overcrowded, lacking finance and facilities—treat such a case for a year or so, perhaps see a slight improvement, then have to discharge him or her, as the case may be, for more urgent cases needing that bed.

Too often, however, is the excuse: "What is the good? The child is hopeless mentally."

The commission feels that Miss Kenny is to be commended for espousing the cause of these children. Her methods differ in no way from those of the orthodox, but she has thought out some ideas that are new at least to reeducators in this State, viz., the coir matting, sand-pit and walking up stairs. Orthodox treatment could well adopt them, if it has not already done so.

There were eleven cases of spastic paralysis examined. One went back to Sydney without reexamination. One was reexamined five months after first examination, two were reexamined eight months after first examination, and seven were reexamined twelve months and later after first examination.

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One child showed wonderful improvement.
One child showed quite good improvement.
Five children showed only slight improvement.
Three children showed no improvement.

In view of Miss Kenny's dictum quoted above, twelve months and less is a very short time in which to expect results. Those who show improvement will go on improving, aided undoubtedly by the treatment received at the clinic, but also by experience and age, as does a normal child.

Given the facilities, the time and the financial aid, we consider that orthodox treatment could and would produce similar results.

RESULTS OF ELIZABETH KENNY METHOD OF TREATING PARALYSIS.

At the beginning of the commission's investigation Miss Kenny was asked to give an estimate of the patient's chances of recovery if treated by her method. This was given by Miss Kenny in six (6) cases. As her claims appeared to be too optimistic, the commission discontinued this request, feeling it might later be considered by Sister Kenny to have been unfair. The commission's opinion has been borne out by a comparison of the results achieved by Miss Kenny's treatment with the forecast which she made in those six (6) cases. (*Vide patients Nos. 2 et cetera.*)

Summary of Case Abstracts.

1. Sister Kenny's forecasts are not borne out by subsequent reexamination by expert members of the commission. These forecasts were made in her confidence that the method was superior to any other in existence. To quote:

(a) In Case No. 31 Miss Kenny stated that this child would be cured in all muscles in two years. This case is little better than the day it first appeared in the clinic, two years from that date.

(b) In Case 8 Miss Kenny's forecast was: hand 100%, wrist 100%, forearm nearly 100%, elbow and shoulder 80% muscle recovery. Two years later examination showed hand, wrist and forearm not markedly improved. There was, however, some degree (5% to 10%) improvement in function of elbow and shoulder. These improvements were undoubtedly due to trick movements and resulted in the child being able to feed herself.

(c) Miss Kenny's verbal and written promise to secure 100% restoration of function in paralysed limbs has not been fulfilled in any case that has come under the observation of the commission.

2. The forecasts by the expert members of the commission have almost exactly been confirmed by the subsequent examinations.

3. Of those patients who had received standard treatment for two years or more, the large majority have not benefited when judged on an estimate of muscle power. In those that have benefited, the improvement has been slight and of no functional advantage, except in Case 8, above.

4. One patient showed marked improvement. Although he had had several years' treatment by

medical men and masseuses he had never received orthodox treatment by muscle reeducation of the kind recognized by standard methods. There is no doubt that Miss Kenny does improve the neglected case, as would any form of muscle reeducation.

5. It is certain that the Kenny method of treating scoliosis (lateral curvature of the spine) is inadequate and dangerous, in that there is no support given to weak spinal muscles. Case 15 showed distinct deterioration and has abandoned Kenny Clinic treatment.

6. The Kenny method of treating muscle contractures is out of date and inefficient.

7. The commission witnessed deformities developing in cases actually under Kenny Clinic treatment. This was so in Cases 2, 15, 23, 28 and 48.

Replies to questionnaires addressed to parents or guardians indicate that a large majority of these observers consider that the treatment has resulted in some improvement of muscle function.

The commission, however, after carefully comparing these replies with its own observations, concluded that parents or close relatives were greatly impressed by minor improvements in certain muscle groups. None of these improvements restored a previously useless limb or muscle group to usefulness, except in the case of Case No. 8, which child can now help to feed itself with an upper extremity which was apparently of little use before the clinic treatment. But even here such an improvement is due to the development of trick movements. There will be no increase in the possibility of this child's earning a living with this limb.

It was noted, too, that where certain muscle groups had improved in many cases, other muscles had retrogressed. The commission in such a case would note no improvement (and no retrogression). Something similar is seen in orthodox practice. A child may be discharged and all active treatment ceased. Such cases often learn trick movements of their own—useful little movements, and often at the expense of other muscle groups.

The commission also examined the reports of observers of the Kenny method in the original Townsville clinic. Two of the Townsville observers presented favourable reports, and two, unfavourable reports.

With the report of one medical officer at that centre, that the Kenny method produces results better than can any other known method, the commission decidedly disagrees. At the same time the commission accepts this doctor's report that some good results were obtained in acute cases, for there is no doubt that under any system of treatment a large percentage of acute cases will recover fully. That depends, as is well known, on the degree of destruction of nerve matter in the cord. No method can be judged entirely by the number of complete recoveries in acute cases. The commission feels that the danger of the Kenny system of abandoning immobilization would be shown in those cases that do not recover full muscle power.

THE ROYAL COMMISSION ON THE INVESTIGATION OF PARALYSIS.
Statement concerning Cases of Poliomyelitis Examined.

| Patient. | Date of Onset. | Dates of Examinations. | Time Between Examinations in Months. | Prognosis. | | Commission's Conclusion after Reexamination. |
|------------|--------------------------|--|--------------------------------------|---|--|--|
| | | | | Commission's. | Miss Kenny's. | |
| Case No. 1 | 20/12/35 Age 11 years | 1st 4/2/36 2nd 18/8/36 | 6½ | | | This case shows considerable improvement in all muscle groups. Equivalent improvement would be expected under standard treatment. Will improve further—may become practically normal. |
| Case No. 2 | 14/12/24 Age 6 years | 1st 15/10/35 2nd 7/7/36 3rd 28/9/37 | 8½ 15 | It appears that on account of the fixation certain muscle groups have been functioning below capacity. The prognosis is that the present method of locomotion (i.e. with calipers and crutches) is the best means of locomotion and she would be advised to remain as she is today. However one of the members of the Commission is of the opinion that with a stabilization of both knees done now she should walk well. | Will walk with one or two sticks without crutches and calipers in two years with constant clinic treatment. Would expect her to walk sufficiently well to assist in housework and to walk to tram. (Sgd. by Miss Kenny 15/10/35.) | 7/26. There has been distinct improvement in hip extensors on both sides and in abdominal muscles. Although no actual measurements were recorded at the first examination we have the impression that the genu recurvatum on the right side (and genu valgum) has increased. We consider it detrimental that she be allowed to walk with the knee unsupported, because of the marked stretching of the crucial ligaments in the right knee. In the 15 months since last examination there has been no return of power in muscles previously paralysed, e.g., both lower limbs below knee. As would be expected, the discarding of calipers (no "disease" weakness) and persistent muscle training, there is improvement in some muscles of both thighs; but functional gain is nil. Knee and ankle deformities are worse; this is due to being allowed to walk without calipers. |
| Case No. 3 | 15/2/32 Age 10 years | 1st 12/11/35 2nd 1/4/36 3rd 13/6/36 4th 1/12/36 | 4½ 2½ 6½ | Under orthodox reeducation, splinting and massage would expect slight improvement only. Will never rise to sitting from supine position without the use of arms. | 1/4/36: At the time of examination, Miss Kenny stated as her forecast that this lad would sufficiently recover to be able to assist his father in farm work. | 8/7/36: This patient practically <i>in statu quo</i> . 1/12/36: Reexamined; no essential change in condition. Has learned to balance himself better, he says. |
| Case No. 4 | 7/12/34 Age 2 years | 1st 15/4/36 2nd 16/2/37 | 10 | | | 25/2/37: This child's right lower limb was and is functionally useless — detailed examination of muscle groups shows distinct retrogression in practically all groups. Slight improvement in <i>extensor longus digitorum</i> . Subluxable hip joint is no worse; in fact it appears to be a little better. |
| Case No. 5 | 1922 Age 5 years | 1st 5/12/35 2nd 25/8/36 3rd 8/9/36 (a) | 9½ | It seems unlikely that there will be further material improvement in this case. Scoliosis is likely to be stationary—may improve a little. We discount reports of extent of shortening in this case. | | (a) Reexamined account probable exhaustion on 25/8/36. Tests of individual muscles show no improvement, but definite deterioration in several groups of right leg, and especially of right foot, according to figures recorded. On referring, however, to report from Townsville Clinic dated 31/10/34, it seems more likely that this foot has remained <i>in statu quo</i> . The recorded condition of muscles of leg and thigh at that date correspond closely enough with subsequent records—length of limb measured 25/8/36. Shows shortening of 1.75 inches. [See note (b) of 25/8/36.] This limb was alleged to have grown in length. Psychology: Stated on examination, 25/8/36, that she had so far recovered as to spend a day at the Show—that "she had walked from the Town Hall to the Clinic in five minutes". This is obvious exaggeration. In this case the patient claims considerable functional improvement; tests of muscle power do not bear this out. |
| Case No. 6 | 21/12/32 Age 7 years | 1st 18/2/36 2nd 17/11/36 | 9 | | | 27/1/37: Data insufficient for purposes of Commission. Note, however, there was very little disability recorded at first view. There is recorded on 17/11/36 a slight foot drop in right limb, which was <i>not</i> present on first view. Summary: No improvement; possibly a little deterioration. |
| Case No. 7 | —/2/30 Age 17 years | 1st 19/11/35 2nd 6/10/36 | 10½ | Outlook very bad. No treatment can give useful upper extremities. Leg could be improved by surgical measures. | | We consider he is for all practical purposes <i>in statu quo</i> . The patient himself considers his muscle power improved, but he admits he has acquired no useful movement as yet. Outlook: We consider arthrodesis of both shoulders would improve function. Prospect of improvement in usefulness of limb under present treatment not good. |

THE ROYAL COMMISSION ON THE INVESTIGATION OF PARALYSIS.—Continued.
Statement concerning Cases of Poliomyelitis Examined.—Continued.

| Patient. | Date of Onset. | Dates of Examinations. | Time Between Examinations in Months. | Prognosis. | | Commission's Conclusion after Reexamination. |
|-------------|-----------------------------------|---|--------------------------------------|---|---------------|--|
| | | | | Commission's. | Miss Kenny's. | |
| Case No. 8 | ~11/29 Age 5 years 8 months | 1st 10/10/35 2nd 23/6/36 3rd 1/9/37 | 8½ 14½ | Outlook for foot is good. We consider that tenotomy would be justified; this not materially urgent. Should develop 100% recovery for practical purposes in leg. Left arm deltoid has a chance of two-thirds recovery in two years' time. Biceps flexion good, extension limited to 2 or less. Supination not foreseeable on account of contraction. Function of hand should develop to 3½. | | There is distinct improvement in function in so far as child can now feed herself with spoon or fork. Record of condition of muscles at previous examination too vague for comparison. At previous examination could not put hand beyond breast-line. Now can put same to mouth. Restoration of function is due to action of shoulder muscles. Arm muscles not improved. Can raise left hand slowly up to left face and up to left temple about six times, then tired. Can abduct elbow from side to 15° using scapular muscles. Examination shows contracture of pronators. There are practically no supinators. It is possible that the unrestricted action of pronators has prevented development of supinators. Flexion of elbow partly by biceps, but partly also by <i>supinator longus</i> and flexors. |
| Case No. 9 | 29/12/31 Age 8 years | 1st 5/11/35 2nd 11/8/36 | 9 | Do not anticipate any useful recovery in these limbs under any treatment. Consider further treatment should be aimed at avoiding increase in deformity—especially of lordosis. Otherwise intense daily or frequent treatment inadvisable. Would be better learning a trade. | | There is slight improvement in abdominal muscles. Otherwise no change excepting minor deterioration in some muscle groups as noted. Lordosis <i>in statu quo</i> . Child states she is much better. Undoubtedly no useful improvement. |
| Case No. 10 | ~5/22 Age 3 months | 1st 6/2/36 2nd 29/9/36 | 7½ | | | 27/1/37: There is definite increase of power of glutei on both sides and possibly both ilio-psoas muscles, also in muscles of left forearm. There is definite deterioration of both quadriceps and hamstrings. Much of weakness of glutei may have been due to disuse accompanying the various surgical procedures he has undergone. There is a distinct and fairly widespread improvement in the power of the left forearm. |
| Case No. 11 | ~12/31 Age 6½ years | 1st 24/10/35 2nd 4/8/36 | 9½ | The flail limb remains <i>in statu quo</i> (right). The left lower extremity will never be useful for locomotion unless some surgical procedure is undertaken. The best we could hope for with surgical interference is a moderately stable limb. That would allow for walking with crutches, without calipers. Therefore we are of opinion that no material restoration of muscular function of lower limb will occur. | | 5/8/36: According to figures case shows distinct retrogression. Attendant and patient both stated that there would be more movement if limbs were warmed up. |
| Case No. 12 | ~1/32 Age 32 years | 1st 29/10/35 2nd 28/7/36 | 9 | Consider that further reeducation and massage would produce no material benefit. | | 5/8/36: Commission consider that there is no useful function regained, although the figures indicate slight improvement in certain muscles. In peroneals, <i>flexor digitorum brevis</i> (left side) and in the flexors of the toes on the right side. Contractures are somewhat lessened. Still a hopeless cripple. |
| Case No. 13 | ~1/20 Age 13 months | 1st 24/3/36 2nd 11/11/36 | 7½ | | | 18/11/36: <i>In statu quo</i> . |
| Case No. 14 | ~2/32 Age 7 years | 1st 5/11/35 2nd 1/9/36 | 10 | Anticipate no useful recovery under any method in either lower limb. The lordosis will remain, most likely in long run even if rectified now. | | Records show this child <i>in statu quo</i> . |
| Case No. 15 | 25/12/31 | 1st 12/11/35 | | This child with efficient support and appropriate exercises would improve. (We consider the present brace inadequate, although applied on professional advice.) Would advise expert application celluloid jacket. Consider unless adequately supported scoliosis will get worse. | | Scoliosis has become worse. Cinematograph records show scoliosis much worse. |

THE ROYAL COMMISSION ON THE INVESTIGATION OF PARALYSIS.—Continued.
Statement concerning Cases of Poliomyelitis Examined.—Continued.

| Patient. | Date of Onset. | Dates of Examinations. | Time Between Examinations in Months. | Prognosis. | | Commission's Conclusion after Reexamination. |
|-------------|--------------------------|--|--------------------------------------|--|---------------|--|
| | | | | Commission's. | Miss Kenny's. | |
| Case No. 16 | —/—/19 Age 5 years | 1st 10/3/36 2nd 3/11/36 | 8 | | | In right leg. Anterior tibial has improved from 1 to 3. Other muscles are <i>in statu quo</i> or have regressed 1 to 2 points (except for right deltoid, which has improved from 1 to 1.5). Left arm is <i>in statu quo</i> . |
| Case No. 17 | —/5/35 Age 14 years | 1st 22/10/35 2nd 16/6/36 | 8 | The deltoid is expected to regress unless splinted. Recovery in this case is vague. Agreed to keep under observation for comparison of results of Kenny treatment and orthodox. Generally, full recovery not expected. Impossible to forecast amount of recovery. Possibly may be two-thirds, but majority agrees 50%. | | 1/7/36: As this was an early case and previous examination is not very complete or satisfactory for comparison, it is difficult to assess degree of improvement, but our opinion is that at any rate there has been a small amount of recovery in some muscles, with deterioration of external rotators. This was a recent case, and one would expect a certain amount of recovery independent of treatment. No appreciable recovery in deltoid. |
| Case No. 18 | 13/1/32 Age 10 years | 1st 29/10/35 2nd 8/12/36 3rd 14/9/37 | 13½ 9½ | We anticipate that his weak limb will not make any recovery of practical value. Would improve under orthodox treatment such as he was receiving at "Montrose". Comparison with report made before leaving "Montrose" shows that left lower extremity has decreased in functional power. There is a slight improvement in knee flexion. There are in full limb minor alterations in function (<i>plus</i> and <i>minus</i>), but on the whole he has remained <i>in statu quo</i> . | | 27/1/37: <i>In statu quo ante</i> , except for a slight deterioration in left leg. 14/9/37: No material change since last examination. |
| Case No. 19 | —/8/28 Age 47½ years | 1st 10/12/35 2nd 14/7/36 | 7 | | | 5/8/36: The Commission considers that there has been a definite improvement in flexion and extension of the toes and the peroneals of the right side, also slight improvement in right anterior tibial. Above the knee there has been improvement in the right quadriceps and in the left hip abductors. <i>N.B.</i> —We consider it advisable to go into previous treatment. 23/3/37: Inquiry by the Commission in the presence of Miss Kenny elicited the fact that the patient had received ample "rubbing", but no muscle reeducation until his arrival at the clinic. |
| Case No. 20 | 24/12/34 Age 10 years | 1st 31/10/35 2nd 15/3/37 (a) | 16½ | All agree case had bad outlook. Would anticipate no useful recovery of lower limbs. Orthodox methods stipulate frame or splinting to prevent deformities. Lordosis inevitable. | | 11/5/37: There is no appreciable improvement in either lower limb. There appears to be some improvement in the abdominal muscles according to the recent Sydney report. (a) Second examination made by the Medical Superintendent of the Elizabeth Kenny Clinic, Sydney. |
| Case No. 21 | 5/1/32 | 1st 9/1/36 2nd 13/10/36 | 9 | | | 27/1/37: No improvement whatever. |
| Case No. 22 | 29/12/34 Age 17 years | 1st 31/10/35 2nd 16/3/37 (a) | 16½ | We have seen patients in similar condition recover complete power with orthodox treatment—splinting and reeducation. Consider this case would be a useful test case for orthodox methods. | | 11/5/37: Sydney report states there has been very considerable degree of recovery in function. There is very little difference in his condition from 31/10/35 to 16/3/37, but from the report of Dr. Sweetapple carried out three months after onset, there has been considerable recovery. This would be expected under any or no treatment, as he was a very mild case. |
| Case No. 23 | —/—/31 Age 3 years | 1st 9/1/36 2nd 19/1/37 | 12 | Has sufficient walking muscles at present in action to justify anticipation that walking may improve further; should wear caliper to prevent deformities, e.g. flexion of right hip, and to support knee and ankle, as there are grave possibilities of deformity after she leaves the clinic, especially if she puts on weight. (Present treatment appears to be sufficient to prevent deformity.) | | 27/1/37: Slight improvement in left <i>gluteus maximus</i> and in abductors and adductors both thighs, slight deterioration ilio-psoas both sides. Other muscles unchanged. Effective improvement negligible. Deformities not improved, but a little worse. |

THE ROYAL COMMISSION ON THE INVESTIGATION OF PARALYSIS.—Continued.
Statement concerning Cases of Poliomyelitis Examined.—Continued.

| Patient. | Date of Onset. | Dates of Examinations. | Time Between Examinations in Months. | Prognosis. | | Commission's Conclusion after Reexamination. |
|-------------|-------------------------------|--|--------------------------------------|---|--|---|
| | | | | Commission's. | Miss Kenny's. | |
| Case No. 24 | -/4/32 Age 5½ years | 1st 19/11/35 2nd 22/9/36 | 10 | Noting that child was originally completely paralysed in the right arm and left leg, and partially paralysed in right leg, and originally thought would never walk, we consider that as he has improved so much he will probably improve further and walk without apparatus eventually. Consider valgus deformity probable unless apparatus used. Does not think upper right extremity will ever do much good. Would advise aeroplane splint. | | There has been definite retrogression in several muscle groups. Marked in the left foot. Of the muscles of the right upper extremity those which matter most (viz. deltoid, biceps, supinator, pronator, flexors of fingers and thumb) none but the deltoid shows retrogression. 17/11/36: Patient walks with tendency to genu recurvatum. Genu valgum and internal rotation of the knee on the left side. |
| Case No. 25 | -/11/94 Age 3 years | 1st 24/3/36 2nd 2/2/37 | 10 | | | 4/2/37: This patient is substantially unchanged. Figures show slight deterioration in condition of left lower limb, but not more than would be consistent with average variation, except in two muscles, <i>flexor brevis digitorum</i> and <i>flexor brevis hallucis</i> . (NOTE.—This patient's mother died three weeks before reexamination.) |
| Case No. 26 | -/-/38 Age 5 years | 1st 3/3/36 2nd 24/8/36 | 5½ | | | 26/8/36: There appears to be certainly no improvement. Probably slight deterioration in certain muscle groups as indicated in the chart. |
| Case No. 27 | -/12/31 Age 3½ years | 1st 21/1/36 2nd 19/10/36 | 9 | One would not expect very much useful recovery of function in the right lower extremity below the knee. | | 27/1/37: In the condition of certain muscle groups of his good leg there is slight improvement recorded, viz. <i>gluteus maximus</i> , illopos, abductors and outward rotators. Otherwise no change. |
| Case No. 28 | 1/12/36 Age approx. 1 year | 1st 28/12/36 2nd 23/3/37 3rd 14/9/37 | 3 5½ | | | 11/5/37: Recent case. There has been slight improvement in some groups—not more than could be expected under any or no treatment. (N.B.—Chairman's particular observation at first examination that child gave no evidence of pain, although nurse in attendance stated she had cried when limb was first moved (i.e. on the same day, 28/12/36). 22/9/37: This child is much more severely affected than was apparent at earlier examinations. (Child's age limited possibilities of accurate quantitative estimation of muscle power.) Child now cooperates well. Left leg is practically flaccid below the knee, and also several groups above the knee are greatly affected, e.g. gluteus and quadriceps. Deformities are beginning, e.g. <i>metatarsus varus</i> and foot drop. For the latter a "right-angled foot" splint is being used at night. Not enough is being done to prevent the varus deformity. |
| Case No. 29 | -/1/26 Age 3 years | 1st 7/10/35 2nd 21/7/36 3rd 21/9/37 | 9½ 14 | General agreement will be no recovery up to 1-5 in any group other than extensors of wrist and flexors. Actually consider there will be negligible improvement (if any). Always a useless limb. | With exception of thumb expects to give child a useful arm so as to hold things, like using a fork and holding instruments for work. But improvement in four years. Would be able to scratch mouth and feed with it. (Signed by Miss Kenny.) | 27/1/37: No change recorded. 22/9/37: No change whatsoever. |
| Case No. 30 | 25/10/31 Age 1 year | 1st 22/10/35 2nd 30/6/36 3rd 21/9/37 | 8 | Expectation for deltoid recovery is very little (if any). Forecast: An arthrodesis at ten years of age. The orthodox surgeon does not consider any further treatment in massage department is justifiable. | Expect the patient will have a useful arm with which she will be able to feed herself, do sewing and dress herself in two years. (Unsigned.) | 8/7/36: It appears that there has been distinct retrogression in the adductors of the shoulder—trapezius and wrist extensors. All other muscles are <i>in statu quo</i> or slightly less; there is no improvement in any muscle group. Also note retrogression in <i>flexor pollicis longus</i> . 22/9/37: <i>In statu quo</i> . |

THE ROYAL COMMISSION ON THE INVESTIGATION OF PARALYSIS.—Continued.
Statement concerning Cases of Poliomyelitis Examined.—Continued.

| Patient. | Date of Onset. | Dates of Examinations. | Time Between Examinations in Months. | Prognosis. | | Commission's Conclusion after Reexamination. |
|-------------|--|--|--------------------------------------|---|---|---|
| | | | | Commission's. | Miss Kenny's. | |
| Case No. 31 | 15/5/35 Age 5 years | 1st 8/10/35 2nd 8/6/36 3rd 14/9/37 | 8 15½ | Consensus of opinion that deltoid will not recover power beyond 2-5, although in experience of people recovery may possibly be more in two years. | Child will be fully recovered (all muscles) in two years. (Signed by Miss Kenny.) | 1/7/36: There is not any evidence of improvement beyond what would have been achieved by standard treatment. There is improvement in elbow flexion, but deterioration in rotators (especially outward). This was a recent case, and one would expect a certain amount of recovery without any treatment. Case to be seen again re deltoid in near future. 22/9/37: There has been no effective improvement in function. As regards the left deltoid muscle, it is functionally useless still. Under standard treatment this muscle would have been maintained in the relaxed position by an abduction splint, and the Commission is of opinion that there is still a possibility of some recovery if this be carried out. If, after an adequate period, no further recovery had taken place, one would recommend an arthrodesis of the shoulder joint, as the trapezius and other scapular muscles are acting strongly. This surgical procedure should not be undertaken unless the muscles have been given the chance of recovery by splintage. |
| Case No. 32 | —/—/21 Age 2 years | 1st 17/3/36 2nd 24/11/36 | 8 | | | 27/1/37: Figures recorded at test show slight improvement fairly widely distributed. It should be noted, however, that on each examination the same curious non-cooperative attitude of mind was observed and recorded. Greater power was in resistance to movement than in performance of active movement. |
| Case No. 33 | —/—/23 Age 9 months | 1st 7/11/35 2nd 1/4/36 | 5 | Will never walk unaided. | | 27/1/37: There is practically no difference in this child's condition. |
| Case No. 34 | Birth (Age 13 years) | 1st 14/11/35 2nd 3/11/36 | 11½ | 1/4/36: The addition of athetoid movements to spasticity indicates grave prognosis; nerve resection operation may improve gait if followed by adequate after-treatment. | | 27/1/37: Though said to be getting better, cannot see any improvement. |
| Case No. 35 | Birth (Now aged 10 years) | 1st 10/3/36 2nd 17/11/36 | 8 | The Commission considers that in view of intelligence this patient would improve a great deal under orthodox treatment. Would probably be able to sign his name; may possibly be able to write a little legibly. Speech will improve and gait would improve. Would probably never be able to do any valid work of any kind. | | 27/1/37: There is an improvement in this child, but nothing outstanding. |
| Case No. 36 | Birth (Now aged 2½ years) | 1st 9/1/36 2nd 27/2/36 3rd 14/8/36 | 2 5½ | | | 27/1/37: This child is improved, and as time goes on will continue to do so, but will never be normal. |
| Case No. 37 | | 1st 27/2/36 2nd | — | | | 27/1/37: Child is in <i>status quo</i> . |
| Case No. 38 | 6 months after birth (Now aged 5½ years) | 1st 7/11/35 2nd 27/2/36 3rd 10/11/36 | 4 8½ | Prognosis bad. We expect improvement to be slight, on account of child's poor mentality. Only improvement would be accountable for by age. Prospects of walking (unaided) in three (3) years extremely slight. | | 27/1/37: There is a slight improvement in this lad. |
| Case No. 39 | Birth (Now aged 5 years) | 1st 17/3/36 2nd 19/1/37 | | | | 27/1/37: <i>In status quo</i> . |
| Case No. 40 | Birth (Now aged 6 years) | 1st 29/10/35 2nd 6/10/36 | 11½ | In hands of competent re-educationalist this child will improve to the extent of walking, how well we cannot say; but in the hands of a specialist in this particular work the child will do better than under the average hospital routine available at present. A proper prognosis would require mental testing. | | 27/1/37: There is some improvement in this boy. |

THE ROYAL COMMISSION ON THE INVESTIGATION OF PARALYSIS.—Continued.
Statement concerning Cases of Poliomyelitis Examined.—Continued.

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|-------------|---|-----------------------------------|--------------------------------------|--|---------------|---|
| | | | | Commission's. | Miss Kenny's. | |
| Case No. 41 | 7 months after birth (Now aged 4 years) | 1st 4/2/36 2nd 20/10/36 | 8½ | We anticipate some general improvement. | | 27/1/37: There is some improvement in this boy, but nothing of much value. |
| Case No. 42 | Birth (Now aged 5 years) | 1st 3/12/35 1nd 10/8/37 (a) | | | | 11/5/37: There appears to be an improvement in this case. (a) Second examination by Medical Superintendent, Elizabeth Kenny Clinic, Sydney. |
| Case No. 43 | 11 months | 1st 31/10/35 2nd 2/7/36 | 9 | | | 11/5/37: As far as the comparison is of any use, the child appears to be <i>in statu quo</i> . Improvement negligible. The improvement in walking would be expected as the child became older. |
| Case No. 44 | Birth | | | Will improve, but impossible to say how much. | | Child has improved. Can now get about unaided; method of progression is by running. Still inclined if she attempts to walk slowly to put dorsum of right foot on the ground first. Answers questions well, but speech is somewhat thick. 27/1/37: There is a decided improvement in this child. |
| Case No. 45 | 3 years 2 months | | | As this child was practically normal in all muscles of left arm, hand and foot other than posterior tibial, consider that his recovery will be complete. | | Miss Kenny states that there is some improvement in left <i>opponens pollicis</i> . Otherwise there seems to be very little difference in child's condition from when previously seen. Beyond some weakness of left hand and left forefoot, there appears to be very little matter with this child. Speaks quite well—can put tongue in any direction. Answers questions well; runs like a normal child. Intelligence appears normal. 27/1/37: Except for the statement by the nurse that there is some improvement in the left <i>opponens</i> (which we can neither confirm nor deny), there is no apparent change in the child's condition. |
| Case No. 46 | Birth | | | | | This child seems to have no paresis or contractures in either upper extremity. Tests show a full range of movements of the right upper extremity. This is vague, but there appears to be a shade more deliberation in certain movements in this extremity. |
| Case No. 47 | | | | | | 20/2/36: Mild paralytic claw foot (right side), with contracture of plantar fascia and slight tendency to clawing of toes. Moderate contracture of <i>tendo Achillis</i> , with tendency to walk on toe when hurrying. (Foot reaches to right angle when knee flexed.) Right tibialis anterior have negligible function. (Walks with drop-foot gait.) |

Another observer at Townsville reported that in chronic cases Miss Kenny had not achieved good results, so that the medical evidence from Townsville cannot be accepted as evidence that the Kenny system is "better than any known method".

Neither Miss Kenny nor any other supporter of this statement can know that in the last epidemic in Queensland, at the Children's Hospital, out of 121 epidemic cases, 87 left the hospital without any incapacitation whatever, and that from a much smaller series of cases at the Mater Children's Hospital half the children left the institution with no incapacitation, and of the remaining half all but one walked out of hospital. In the two hospitals the number of paralysis cases was 147; 100 of these

children were discharged with no loss of function. In the figures available from the hospital subcommittee, 78 cases from the 121 were discharged with no paralysis at all. These results may be compared with those from Massachusetts quoted as far back as 1907. Here 57 paralysed cases recovered completely out of a total of 212.

Although the above figures show that the orthodox method can produce excellent results, we wish to stress that no system can vindicate itself entirely by considering its percentage of recovery. In this respect Miss Kenny stated in her evidence before the commission that she had seen only 35 acute paralyses. In 12 of these Miss Kenny has records, and of these 12, only 2 are claimed by her to be

severe. In at least one, medical authority states that the child was not paralysed and suffered only from paresis.

Reports of injuries or ill-effects, and counter-charges, are always apt to be unsavoury. Extravagant statements and generalizations are better disregarded, but a few specific instances merit consideration.

To substantiate her objection to splinting, Miss Kenny reports a number of cases with joints stiff and in some cases in faulty posture as a result of prolonged splinting.

A specific case observed by the commission was No. 49, who was admitted from a hospital where she was under standard treatment, including "support" in a "gutter splint" for a paralysed leg. The knee was stiff—very little movement was possible without causing pain—and there was also some *genu recurvatum* or backward displacement of the knee.

According to the surgeon in charge of this case, one of the standing directions for the treatment of all such is that supported joints must be moved through their full range at least once a day.

The only possible conclusion in this instance is that these daily movements had not been carried out. Such an omission might be due to neglect or to oversight, to failure of attendance by the staff concerned, to intercurrent illness of the patient. The orthopaedic surgeon points out that although disagreeable and perhaps distressing, this stiffness is never disastrous; it responds readily to treatment. When it occurs, however, it indicates that standard treatment has not been correctly applied.

Similarly, *genu recurvatum*, or any other faulty posture or deformity of a joint which has been splinted, indicates that there has been some faulty alignment or application of the splints. In children who are growing, or whose muscles are becoming large or smaller in the progress of the disease, correct splinting is often very difficult and frequent readjustments necessary.

More unfortunate was the condition of Patient No. 19, who came from abroad after having sought in his own country the best orthopaedic treatment for several years. This patient arrived at the clinic in a very unsatisfactory condition and has since shown great improvement.

Inquiry in this case showed that during a course of treatment which lasted several years, not once had "reeducation" been administered, according to standard or any other method.

The commission cannot explain this omission, but does not believe it could have happened in Australia in similar circumstances. It appears, however, that a large proportion of practitioners have been, and perhaps still are, inadequately acquainted with the methods and results of modern orthopaedic treatment of poliomyelitis.

In another case, No. 50, reported by Miss Kenny, it was stated that the patient was kept in plaster by the orders of Dr. X (orthopaedic surgeon) with the thigh abducted; and that when taken out of the plaster the patient sustained a dislocation of the hip joint, as shown by X ray examination.

Inquiry from the surgeon concerned showed that, according to his notes, this was a bad case of paralysis of the lower limb, which was "immobilized" in a plaster splint with some abduction; that on manipulation a "subluxation" or partial dislocation was observed and easily

reduced. The X ray examination showed the bones in normal position. The surgeon considered the subluxation due to inefficient abduction.

It is recognized by orthopaedic surgeons the world over that the safest way to prevent dislocation of the hip is by abduction of the thigh.

More serious is the case of No. 51, who was splinted carefully and with particular reference to the likelihood of hip dislocation. For over four years this dislocation had been avoided, and the patient was using a "walking caliper".

Attending the Elizabeth Kenny Clinic during the surgeon's absence, this patient was advised to walk without the "caliper"—or at least permitted to do so.

This resulted a few days later in a dislocation of the hip joint, and the calcaneo-valgus deformity of the foot (which is always difficult to prevent) was found later on to be increased.

In the words of the surgeon concerned, this patient "represents the loss of a struggle for four or five years to prevent a dislocation of the limb and a calcaneo-valgus dislocation of the foot".

It will be observed in the summary of cases that under Miss Kenny's care there have been few instances of new or increasing deformity. As already noted, it is only fair to repeat concerning spinal deformities that they are exceedingly difficult to prevent or arrest, and that they do sometimes occur in spite of the orthopaedic surgeon's utmost care and ingenuity. But the less care and skill, the more will be the deformity.

It seems necessary, regarding Miss Kenny's claims to treat new cases, to review the evidence available to the commission.

There was an epidemic of poliomyelitis in the latter half of 1934 and early 1935, affecting north Queensland coastal areas. According to information received from the Director-General of Health, eleven cases were notified from August 3, 1934, to October 23, 1935, from "coastal areas outside the metropolis".

They were some of a group of seventeen cases that were directed to my attention by various practitioners at that time.

Several practitioners mentioned the cases to me, saying that they really could not tell whether they were infantile paralysis or not, because the symptoms were so slight and the paralysis so transient.

Of these seventeen, so far as my memory serves me, one died (probably L.W. recorded here) and of the other sixteen, so far as I recall, four were treated and recovered and twelve recovered to an equal degree without treatment.

The commission has ascertained that not all of the cases actually treated in the Townsville clinic were notified. This seems to confirm the report that the epidemic was of an unusually mild and indefinite type and that probably many notifications were missed.

Miss Kenny's method now differs essentially from orthodox treatment in only two points, the early movement of the limb during the stage of muscle tenderness and the refusal to accept the principle of relaxing every paresed muscle by suitable splinting.

Judging from the experience of Brisbane epidemics, this muscle tenderness does not continue longer than two or three weeks at the most, and

in many cases less than a week. During this period standard treatment allows the damaged limb complete rest, with the exception that it is handled and tested daily to find if the soreness is abating. Miss Kenny insists, in contrast, on frequent passive movements (page 32 xx of evidence), every two hours in fact, to the full range allowed by the pain; and she claims that under this treatment the pain soon disappears. In the one early case in her care observed by the commission this was indeed so; whether the soreness of the muscles would have persisted had splinting been used, however, is impossible to say. *As noted already in the Brisbane epidemics, it frequently passed off in a day or two.*

In applying active movements as soon as the pain has abated Miss Kenny again agrees in principle with orthodox procedures. *She accepts further the principle of immobilization to prevent deformity.* For instance, for the prevention of foot-drop she fits on the feet an apparatus which, in her own words, "has to be rigid to prevent foot-drop", preferably for short times only, but "*If we see that there are any deformities occurring, we get the child on its back and keep it there the whole time, and make it keep its foot in that position.*"

Any case, therefore, undertaken after the subsidence of the muscle tenderness received treatment which differs not greatly from the strictly orthodox except in Miss Kenny's refusal to use splints as a general principle. Now, of the six cases reported to the commission—four in Townsville and two in Brisbane—only one was received during this early stage, and she has not made a good recovery, although now nearly twelve months under treatment.

Case No. 31, who was admitted six weeks after the onset of paralysis and who has lived at the clinic most of the time, is (in two years) far from recovered. The paralysis was fortunately not extensive, but there is a permanent disablement of the shoulder. These are the two Brisbane cases.

Of the four Townsville cases, one (No. 52), September 14, 1934, seven weeks after onset, was stated by Miss Kenny to be "paralysed" from the shoulders to the toes, and when admitted to be "fully splinted from the shoulder to the toes in wooden splints". In spite of this condition the child had returned to completely normal condition in two months (November 15, 1934—Dr. Guinane). One obvious inference is that the seven weeks of rest had done no serious harm. (There is, however, more to note. Dr. Taylor reports that he examined this case very soon after admission and that it was not paralysed, but paresed, as he elicited movements at the ankle. Dr. Rountree also reported movements of the arms up to the level of the shoulder, and movements of the toes. Miss Kenny's statement does not tally with these observations; the subsequent progress of the case seems to confirm them.)

Another (Case No. 53) is reported to have been "throwing her leg outwards for 3-4 months". Paralysis was first observed about September, 1933. She was admitted on March 2, 1934, and Dr. Dungan

reports "the weakness mentioned before is now much worse". There was here obviously no "early treatment" and yet she was reported on June 12, 1934, to be "regarded as completely cured".

Another case (No. 54) was admitted November 10, 1934. Paralysis noted four weeks ago; and for that time both legs splinted. Right leg had practically no movement. On December 12 child was walking. "All the movements of the right leg had returned."

Finally, No. 55, admitted November 22, 1934, had had paralysis for one month; had been in hospital for the past two weeks. On admission the child "could not walk and when standing only used the left leg. On examination, all movements of the right leg were weak, but present." The report of December 12 states: "Child is walking quite well now and all movements of the right leg are normal in power and range."

Summing up: Six cases are claimed as "recent". Paralysis or paresis had been established 3 months, 7 weeks, 6 weeks, 4 weeks, 4 weeks, and 4 weeks or less before Miss Kenny's treatment was applied. The two who had residual paralysis began treatment within four weeks and at six weeks, and the former showed (when last seen) an incipient deformity from want of splinting. (Note evidence Elizabeth Kenny, page 35 xx.)

The commission fails to see in this series any evidence that would induce it to countenance the general adoption of Miss Kenny's method. (See the results of cases treated at the Hospital for Sick Children in the last Queensland epidemic.)

Psychological Factors.

Throughout the history of medicine almost every application of a new type of treatment has exhibited identical features. Galvanism, faradism, vibratory machines, diathermy, ionization, massage, the Abrams box *et cetera*, have led to eras of spectacular cures, more imposing than the present series under review, but have been ultimately largely discarded. The truth is often witnessed by the medical profession. Numerous are the new methods of cure that emanate from its own ranks. Many of these alleged cures that are heralded with fanfares later prove to be fallacious. Indeed, even today there are being practised many therapeutic methods that are probably useless. The distinguished neurologist, Dr. T. A. Ross, formerly medical director of the Cassel Hospital, in discussing this topic in a recent publication, makes the following pertinent remarks:

All these organic theories and practices have certain elements in common. They have a season during which they flourish; at this time they work many cures. The men who achieve these cures are very enthusiastic and zealous. After a time the number of cures begins to fall off and the methods begin to give place to others. Even during the period of success there are always men of eminence in the speciality concerned who remain unconvinced, who although they are the kind of men who would be as careful as the successful therapists, nevertheless do not get cures. They are men of a critical rather than of an enthusiastic type.

These cures depend for the most part on the presence or absence of belief. When belief is present in abundance then the theory works; when it begins to fail the theory

begins to fail too. This introduces us naturally to psychological views of the functional nervous disorders, and it may be said here that it will be necessary to observe the same caution in examining these views as was shown in examining the organic.

We have seen that cure was not of itself a criterion of much value in determining the validity of a theory. We must always allow for the effect of faith and hope.

In the case of the Kenny Clinic certain factors have conspired to weld the psychological outlook into one peculiarly formative of both faith and hope. First and foremost is the energetic, enthusiastic and altruistic figure of Miss Kenny, who makes categoric and positive statements of the promised cure. This is buttressed by skilfully directed propaganda. There is warm advocacy by Government departments, whilst just sufficient opposition by conservative medical authority creates an atmosphere of martyrdom. Suggestion and persuasion are strengthened by the liberal use of Government funds, which have been freely used to provide an inspiring and admirable machinery for the carrying out of the method—porcelain baths, colourful appointments, uniformed trainees, free transport and the like. Further factors of great psychological utility include the force of mass suggestion by communal treatment, the intercourse of patients and relatives in an atmosphere of cheery optimism, and the bringing together of people from distant places of the earth, so that the new movement appears of world-wide dimensions.

The impact is cumulative, since the public uncritically believe that if patients from Asia and Africa travel to the Kenny Clinic, it must be good, and that if Sydney, London and elsewhere are adopting the Kenny Clinic idea its worth must be doubly proven. Under the circumstances it would be extraordinary if the result were not one of over-enthusiastic appreciation of improvements by both patients and relatives and credulous reports of cure by the more remote public.

Whilst giving Miss Kenny every praise for her championship of the cripple, her patience in dealing with the sufferers, and her skilful use of psychological factors, this commission, in view of its own observations, considers that the opinions expressed by those personally interested in the welfare of the patients attending the Elizabeth Kenny Clinic are so influenced by the psychological effects of faith and hope that they are not a true reflex of the practical benefits bestowed by the Kenny Clinic, and therefore must be discounted.

The report of the commission would not be complete without reference to the exaggerated status given to infantile paralysis by popular opinion. Sensational scare headlines in the daily Press have engendered a foolish and groundless fear in the minds of many sane parents. Infantile paralysis has been known to have been with us since ancient Egyptian times. We are never without a certain number of sporadic cases, while epidemics occur from time to time in districts all over the world.

It is highly infectious and it is believed that most people have at some time suffered from the disease in minor form and that it is extremely rare for the symptoms to be severe enough to cause paralysis.

The sickness and death resulting from infantile paralysis are infinitesimal when compared with certain other diseases which occur in the community and are accepted with equanimity. In whooping cough, which not only has a high death rate, but also often leaves behind it most disabling lung conditions, little or no attempt is made to isolate sufferers from the rest of the family. There still occur in children cases of lead poisoning from lead paint, due to the ingestion of powdered white lead from the veranda railings. Although these sufferers, when symptoms are severe, not only suffer from paralysis, but die from chronic Bright's disease at an early age, there are still many sane parents who allow their children to play on verandas where the paint on the railings is dry and powdery.

As a final illustration, there are in Queensland over 2,000 road accidents per year. This results not only in many deaths, but a large and increasing number of cripples, many of whom are never able to return again to their former occupations.

The commission is compelled to draw attention to these facts and to suggest that each problem should be treated on its merits and that policy should not be directed by sentiment, as has been the case in the establishment of Miss Kenny's clinics in many towns in Queensland.

It is our considered opinion that there are many other types of cripples on whom the same amount of money expended would have been productive of better and more lasting results in civic capacity. Amongst these reference is particularly made to the backward child, minor epilepsy, heart disease and certain disabilities which require vocational selection and training in order to fit the sufferer into a useful place in the community.

The public should realize that whilst it is natural and praiseworthy to lend a helping hand to better the state of the orthopaedic cripple, it is known that after a certain period of time has elapsed the little improvement that can be expected is not commensurate with the cost, both to the patient and the Government, of daily treatment by experts. Money expended from a very limited public purse must be directed not sentimentally for any particular class, but rather as reason directs in the production of the best results.

In the case of the care of the paralytic it is suggested that in order to lessen the cost of daily treatment at the clinic the attendances should be less frequent, but that whenever possible a parent or guardian should attend on each occasion with the patient and directions be given in home instruction. The necessary apparatus should also be loaned so that the various exercises could be carried out at home much in the same manner as the child practises the piano but attends at regular intervals for expert instruction and correction by a skilled teacher.

PARALYTIC CRIPPLES IN ENGLAND.

Paralytic cripples in England are dealt with administratively in the same way as those crippled from other causes. On leaving school, however, they suffer through ceasing to be a responsibility to any local government authority except in so far as they are chargeable to the Public Assistance Committee (through poverty).

The work for cripples in England is therefore carried on by a combined effort of local authorities and voluntary organizations.

(a) For non-tubercular cripples under five years of age the local education authorities have the duty of discovering all physically defective children in their areas, making proper arrangements for attending to their health and physical conditions and providing further education in special schools or otherwise. The education of such children is compulsory to 16 years (not the statutory 14).

Such education is carried out either (1) in an orthopaedic hospital school, part of the organization of the orthopaedic hospital, usually a voluntary institution, where the local authority pays 40s. to 50s. per week for the treatment of the children; or (2) in ordinary elementary schools; or (3) in residential or non-residential special schools maintained usually by the local authorities.

(b) After school age vocational training is given in cripples' training colleges, voluntary institutions, to which fees of £20 to £90 *per annum* may be paid by the local authorities or from voluntary funds. Certain of these colleges maintain workshops where cripples may continue in gainful occupations.

Voluntary funds are centred in certain local voluntary associations, who supplement the work of local authorities, and particularly try to find employment for cripples.

SUGGESTIONS FOR THE ESTABLISHMENT OF LOCAL VOLUNTARY ASSOCIATIONS.

1. It may be assumed that all successful schemes for the care of cripples must be local ones.

2. All successful work for cripples must be based on an orthopaedic hospital and its associated clinics, which must be within range of the patients' homes.

3. The area of what may be termed an orthopaedic unit should be large enough to support a hospital of not less than 100 to 120 beds. A network of such units will obviously ignore the ordinary divisions of the county into local government districts.

4. Seeing that the success of a local voluntary association depends upon cooperation of public authorities and local associations, the county, borough or the county should be the normal unit for voluntary work. This may cover the area of one or more orthopaedic units.

5. Within the ambit of a local voluntary association should be cooperation with the public authority in (a) ascertainment of cripples, (b) provision for treatment, (c) education, (d) training, (e) employment.

The local voluntary association has the exclusive duty of propaganda to arouse public interest and confirm public opinion, to care for the general welfare of cripples by forming scout troops, finding home visitors, providing wireless sets for bed-ridden patients *et cetera*.

6. The personnel of a local voluntary association should be representative of every hospital, clinic and after-care committee in the area, should include representatives of general hospitals and medical practitioners in the area, as well as individuals interested in the work.

7. In financing a local voluntary association, in order to avoid multiplicity of appeals, it is desirable to share the proceeds of appeals for the hospitals and clinics, a finance committee allotting the proceeds as required.

THE VOCATIONAL TRAINING AND EMPLOYMENT OF CRIPPLES.

1. The best approach is thought to be by local efforts. The central Council for the Care of Cripples, which is a federation of all local organizations, will coordinate and organize this work.

Local training and employment committees should usually be subcommittees of the local voluntary association for the county. Where there is no local voluntary association, an established orthopaedic hospital should promote such work.

In backward areas where no treatment for cripples exists, the provision of adequate treatment facilities is the first need and must antedate any scheme for training or employment.

2. The main function of a local training and employment committee will be: (a) investigating requirements and possibilities; (b) maintaining a register of cripples; (c) to promote training centres; (d) to set up advisory panel of expert craftsmen, arrange for visiting teachers, and promote sale of goods made; (e) classify cripples into categories, noting especially groups who need special employment, who need special conditions for work, and whose employment must be regarded as occupational rather than economic.

After-Care of Crippled Workers.

They should be examined at intervals by a surgeon to determine the effect of the employment on their disability.

Training workshops must be the principal means of dealing with cripples who need special treatment. Though retail sales should be the principal means of disposal of goods produced, the production of orthopaedic appliances is a sound objective for these factories.

For the grossly disabled (which includes most paralysed cripples) home industries run with travelling teachers, and selling through a central agency, are established in London, while a residential colony is being experimented with in Shropshire.

Cripples' Training College, Leatherhead, Surrey, is a voluntary institution largely founded as the

result of a gift of £32,000 from the Bernhard Baron trustees.

Its primary object is to fit the trainee for absorption into organized industry.

It provides: (1) an industrial course; (2) general handyman course; (3) gardening course; (4) cookery course; (5) clinical course; (6) rehabilitation course, designed for workers recently crippled, to teach them to adapt themselves to their particular disability.

The college also provides accommodation for a limited number whose disability needs special institutional conditions, but who can be employed on a partially economic condition in connexion with college activities. Fees are at present 35s. per week.

THE CARE OF PARALYTICS.

Summary.

1. Measures to ensure early and expert treatment in all cases.

2. Census of crippled children.
3. The orthopaedic treatment.
4. The convalescent treatment.
5. General oversight *et cetera.*
6. Education.
7. Vocational training.
8. Placement and employment.
9. Research.
10. Rationalization.
11. Coordination of activities.

Infantile Paralysis.

The adequate care of the crippled child presents a large social problem which needs serious consideration in order to minimize the great economic loss resulting from such conditions. Although this report deals specifically with sufferers from paralysis, it must be remembered that other disabling conditions, such as heart disease, epilepsy and subnormal mentality need similar consideration.

In order to give the best care to paralysed persons and to rehabilitate them to their full measure of usefulness, many problems present themselves. Each of these requires its own special organization. These are as follows:

1. *Measures to Ensure Early and Expert Treatment in all Cases.*—Because poliomyelitis is a relatively rare disease and because moreover its acute manifestations are only seen in epidemics at irregular intervals, there is no question at all that the education of the average medical man regarding this disease has been unsatisfactory and of necessity theoretical rather than practical. In its later stages, because of the necessity for the cooperation of the physician, the orthopaedic surgeon and the physiotherapist, the patients tend to be segregated in hospitals and thus away from the observation of the general practitioner.

The measures necessary for its adequate control and treatment would seem to be: (a) That every case be compulsorily notified. (b) That every case be seen as early as possible by a medical officer of health in consultation with the attending prac-

titioner, and when the medical officer of health considers that changes in the form of treatment are desirable, early consultation with a practitioner having specialist knowledge of the disease should be arranged. (c) That because of the necessity for team work in treatment, it is desirable that these patients should receive institutional care in metropolitan or base hospitals rather than the care of an individual general practitioner. (d) That in order to facilitate the early recognition and efficient treatment of these patients, improvements should be effected both in the undergraduate training of medical students in this disease and particularly in the provision of post-graduate courses of instruction in this disease for medical practitioners.

2. *Census of Crippled Children.*—In Queensland the newspaper publicity surrounding the Kenny treatment focused public attention and led to large numbers of cripples applying voluntarily for treatment.

When this public interest wanes Queensland will be in the position of other communities when the census of crippled children is a difficult undertaking, requiring cooperation between many bodies.

Mr. R. O. Beale, Vice-President of the New South Wales Society for Crippled Children, states that in the Rotary Club survey the following were used extensively: the churches (of all denominations); the Press; the schools (State, public and private); racing clubs (their sympathy and cooperation has been demonstrated in a very practical manner by the fine "Canoburly" organization in Sydney, which is supported by the Australian Jockey Club); labour unions (crippled children of members and non-members); employers' organizations; chambers of commerce and manufacture; the management of boxing, wrestling and similar stadiums; other "Rotary" clubs, "Apex" clubs, "Toc H", boy scouts and girl guides, football, cricket and debating clubs.

3. *The Orthopaedic Treatment.*—This entails the use of present hospital facilities with necessary extensions. In sparsely populated areas there is the added cost of transport of patients to large centres and provision for stay in hospital or hostel, or in the event of non-removal to hospital there is necessary increase in home expenditure.

4. *The Convalescent Treatment.*—The ideal is a resident hostel from which the hospital atmosphere is removed. Community life aids patients to overcome their handicap in a spirit of mutual help.

The Frankston Orthopaedic Hospital, Melbourne, is a good example of the ideal requirement. It stands on about 20 acres of wooded land on the sea-shore about 30 miles from Melbourne. It accommodates 88 patients, with provision for twelve additional sick beds. The beds are always full and the stay in hospital varies from about nine months to three years. The organization is in charge of a resident medical superintendent and an assistant resident medical officer. The hospital is visited at least once weekly by each of four honorary surgeons.

The equipment provides a fine swimming pool and gymnasium, where a resident masseuse gives the usual exercises for muscle reeducation and correction of deformities.

The Education Department supplies three teachers and a kindergartener, and the curriculum varies from kindergarten to merit certificate, and in a few cases to higher grades. The hospital also provides on certain days of the week an instructress in craftwork, with a view to the pleasant occupation of spare time and the training of mind and fingers so that the children will be more fitted to receive technical training later on.

Community life is encouraged by boy scout and girl guide troops. By lectures, a lending library of good books, concerts and moving picture displays, life at Frankston is made as near as possible to the normal life of a normal child. The work is being extended by the building of a hostel for the accommodation of twenty older patients, who are sufficiently well to begin a course of simple technical training with a view to subsequent employment.

Lady Latham, the Vice-President of the Victorian Society for Crippled Children, states:

It is important that the training of these boys and girls should at first be conducted under skilled medical observation. Further, they will benefit greatly by a period of dehospitalisation so that they can learn to do things for themselves before they take their place in the rough and tumble of ordinary community life.

With this statement the commission is in entire agreement.

Whilst expense will preclude the placing of all suitable cripples in such an environment immediately, every effort should be made to provide treatment as near to this ideal at the earliest opportunity.

5. General Oversight, Registration of Cripples, Special Service, Provision of Social Workers et cetera.—The registration of cripples is a considerable task, since efforts have to be made to find them if they move to another locality. The provision and replacement of splints, walking irons, crutches et cetera must be undertaken. A liaison must exist between the treatment centre and the parents. This can only be done by trained home visitors who will make a tactful examination of home conditions, advise parents and report progress. The social section must keep in constant touch with the general hospitals, from whose ranks the majority of the convalescents will be recruited.

6. Education.—It is a lamentable fact that many cripples are poorly educated, owing to the claims on their time made by medical treatment and illness. This work must be taken over by the Education Department. In large centres the ideal is that of the London schools for cripples. The best results are obtained when the cripples are kept away from normal children. They can play games, indulge in sport fitted to their needs, and can receive special tuition in handiwork. These aspects are so obvious as not to need stressing.

7. Vocational Training.—The necessity for the cripple to be eventually self-supporting entails as a preliminary an exact survey of his mental and physical condition. The difficulty and importance of this is shown by a study of the personnel in the New South Wales Committee of the Society for Crippled Children, which investigates each case. It consists of: (a) A chairman, chosen because of his extensive knowledge of technical education and of the work done in the various callings in the community. (b) A medical officer with special knowledge of physical conditions of cripples. (c) A representative of the Department of Labour and Industry, chosen because of his acquaintance with the industrial laws and regulations likely to affect cripples when in employment. (d) A lady chosen because of her knowledge of education and because of an interest in the social welfare of girls. (e) A business man, acquainted with the condition of work in all branches. (f) An architect, chosen because of his general knowledge of structural work and of applied art.

The actual training largely depends on the amount of invalidity, and the cripples are classified as follows:

- (i) Those needing no special training.
- (ii) Slightly crippled, yet not fit for heavy work, but capable of tuition at a technical college. They fall into two groups: (a) able to transport themselves, (b) needing assistance in transport.
- (iii) Severely crippled: (a) needing a slow worker's ticket, (b) requiring attendance in resident school, (c) those unable to travel and must do home work.

8. Placement and Employment.—No scheme is complete which does not find work for the trained cripple. This aspect will be referred to later.

9. Research.—Encouragement should be given to research upon the factors leading to invalidity. This will include the treatment of disease and deformity, the cause and pathology of disease and the prevention of invalidism.

10. Rationalization.—Overlapping of activities is both unsound and uneconomical. There should be a full cooperation and liaison with all activities in other States and the Commonwealth. The Department of Repatriation undertakes the care of many war cripples and has had an unrivalled experience. Cooperation in buying, manufacture and standardization of materials in training and treatment are essential aspects of rationalization.

11. Coordination of Activities.—There must be complete coordination of activities. The steps to the solution must be planned and carried out, not piecemeal, but in their entirety. A considerable stimulus has been given by the Nuffield bequest, but this is necessarily in the nature of a wasting asset and will be exhausted in a few years. In New South Wales and Victoria reliance is placed on the integration of voluntary societies to carry out the work of dealing with the cripple population.

Whilst certain aspects of this are indispensable and can be done by no other agency, e.g., the women's auxiliary, it is certain that in Queensland the disadvantages outweigh the advantages. The special features which lead to this are as follows: the large distances, the sparse population, the lack of a leisured class with time to devote to social work, the greater advance in socialization which has led people to depend on governmental help, particularly in the hospital field. Lastly, the very complex and difficult nature of the task is such as to require the services of a whole-time staff to adequately cope with its ramifications. This can be quickly grasped by reference to a paragraph in Dr. J. H. L. Cumpston's report in the Australian Conference on Crippled Children, in 1936. The staff required and their duties are as follows:

1. Office staff for registration, oversight and general business.
2. Provision of splints and walking apparatus *et cetera*.
3. Finding and registering the crippled children.
4. Sending them to hospitals for orthopaedic treatment.
5. Sending them to convalescent homes for after-care treatment.
6. Seeing that their general education is carried out.
7. Seeing that each child who requires it obtains vocational training.
8. Inquiring into home surroundings and remedying financial needs, if any.
9. Providing employment.

To this list must be added research and interstate liaisons and rationalization.

12. Summary.—In finalizing this brief outline of the essential needs which must be fulfilled if the problem of the cripple is to be adequately dealt with, certain principles must be stressed.

(1) The appropriation of public moneys must bear a just relationship to the actual benefit. There is no more special merit in dealing with crippled children or adults when this is due to muscular or bony deformities than when due to other disease. Unless function can be usefully improved, perseverance with treatment for months or years is not merely economically unwise, but it is depriving other types of invalids of benefits which could be gained by the additional expenditure.

(2) Any appropriation must be duly apportioned over the whole field of endeavour. It would, for example, be uneconomical to spend a large amount of money on treatment of convalescent patients without attending to vocation or placement. Each step in the chain of treatment is equal.

(3) The objective in every case is return to function and return to work.

(4) So important is the psychological value of work that its procural must not be left to chance, an employer's whim or sentiment. Every industry must be compelled by law to find work for a proportion of cripples.

(5) It is necessary to accept the fact that crippledom is an inevitable and probably increasing feature of civilized life. It follows, therefore, that any organization for its relief must be constantly at work, since each month brings its quota of new

patients. The achievement of the best results depends on early attention and thorough care throughout the whole period of invalidity.

No State can afford to spend an unlimited amount on cripples, but in Queensland the services omitted from the ideal requirements are so vital to the problem that they should be commenced forthwith. In a consideration of expenditure it is our opinion that a careful survey of the work done at the various Kenny clinics and other orthopaedic centres reveals, in some instances, considerable wasted effort. The aim must be not merely to show a slight increase in function of certain muscle groups, but to enable the sufferer to earn a livelihood. We hold that where public money is spent it must be productive of the best results, and any expenditure must be budgeted for as carefully as in any other department of life. It should be our objective to avoid the many mistakes made in the past history of social services. The wholesale granting of pensions for persons with physical disabilities has resulted in the development of large numbers of individuals unfitted for any work. Once in receipt of a pension, they usually remain for ever a drag on the community. No pension should be given unless it has been conclusively shown by those experts in social rehabilitation that a return to any type of work is impossible. It must be stressed that a cripple does not need dole or charity, but the training to earn a living wage in competition with his fellow men. Any other course brands him with an inferiority complex more crippling than his original disability.

The cost of the treatment of cripples and their reabsorption into society is heavy. This achievement relieves the Commonwealth Government of a great financial burden, and it is considered that they should in justice bear a quota of the expense. This factor may be best realized by an actuarial reference. That is, to provide £1 weekly for life at the age of sixteen years requires a capital outlay of no less than £1,350. At twenty the amount would be £1,229; at thirty the amount would be £1,177, and at forty the amount would be £1,033. (Figures by courtesy of the Australian Mutual Provident Society.)

The commission made considerable inquiries in its efforts to arrive at some comparison of costs between the Kenny clinics and the out-patients' attendance at the public hospitals. It was, however, found impossible to arrive at any accurate basis of comparison. The institutions are run on considerably different lines, and the relative costs of transport borne by the public, by the Ambulance Brigade and by the Government subsidy of the Ambulance Brigade complicate the matter considerably.

The total expenditure has, however, exceeded £25,000. Omitting capital charges and reckoning on running costs only, including maintenance and salaries, it appears that the cost per attendance at the Kenny Clinic is considerably higher than the cost at the similar department of the Brisbane

Hospital. The commission has no means of calculating what could have been done by the orthopaedic departments of public hospitals had they had at their disposal the money represented by establishment costs of the Kenny clinics.

Summary of Findings.

After two years' study of the work of the Elizabeth Kenny Clinic at Brisbane, from the evidence of Miss Kenny and of experts acquainted with her work directly and indirectly, the commission has arrived at its conclusions on the Kenny method of treating paralysis.

For the purpose of convenience we refer to the method of treating infantile and spastic paralysis used by expert medical practitioners as the "orthodox" treatment, and to that of Miss Kenny as the "Kenny method".

We have found that:

1. Except in one important principle, the Kenny method of treating poliomyelitis differs very little at present from orthodox treatment. Where there is a difference, the orthodox method is better.

2. Originally the Kenny method showed radical departures from orthodox treatment, but in the course of time the former has gradually been brought into conformity with the usual medical practice.

3. The departures from orthodox treatment, especially the present important points of difference, could be and actually were responsible for damage beyond and in addition to that already sustained by the patient.

4. Of a series of patients, forty-seven in number, examined by the commission two years ago and since reexamined at least once and sometimes twice or three times, the majority showed no effective improvement; a few were worse and a few improved. Those who became worse would not have done so under orthodox treatment, and those who improved would have done so to an equal or greater extent under orthodox treatment of equivalent intensity.

5. It is significant that in her original forecasts of the patients' chances of cure, Miss Kenny was highly optimistic, occasionally to the point of being fanciful. Later she became more cautious. We interpret this inconsistency as a consequence of Miss Kenny's unfamiliarity with the nature of the work she was undertaking and as proof that she learnt as she went along, not only caution, but orthodox technique as well.

6. The return to the people of Queensland from Government expenditure on account of the Kenny clinics was disproportionately small. The return would have been much greater if the same amount of money had been spent in already existing orthopaedic departments of public hospitals and on vocational training. For many cases of paralysis treated by Miss Kenny nothing further could have been done. The slight improvement in others, of little real use to the patient, involved a waste of

time spent in treatment which might have been used to better advantage.

7. The belief held by many people in the possibility of cure and in the reality of improvement by the Kenny method, in spite of facts to the contrary, is attributable to Miss Kenny's strong personality, her own conviction of technical competence and to improvement in patients treated by her, all of which combined to inspire the patients and relatives with great hope and especially with unshakable loyalty to Miss Kenny.

8. Miss Kenny may claim credit on two counts. Though she has neither discovered nor applied any new principle, she has drawn attention to the plight of the crippled child, who was too often denied hope of possible further usefulness. Some children suffering from spastic paralysis did improve very much under her treatment, which differed from orthodox treatment only quantitatively. The commission believes that a trained masseuse can obtain similar results if given the same opportunity of concentrated attention on a given case.

9. Action taken to make effective Miss Kenny's claims was unbalanced. For the most part it was political, without really expert preliminary investigation. Many cripples, beyond further aid, wasted their time and public money in a repetition of treatment (modified in some cases for the worse), the possibilities of which they had already exhausted. The state of affairs was made worse because of Miss Kenny's inadequate knowledge of the conditions and mechanisms amongst which she was to test her theories and assumptions.

10. Miss Kenny's method adds little of value to orthodox treatment and discards principles which sound opinion considers essential. The method of reeducation is no better than orthodox treatment; indeed, it is faulty, as already stated, and has no advantages that would enable treatment to be efficiently carried out without splints.

11. The commission cannot recommend the application of the Kenny method to the treatment of cripples at any stage of paralysis, and especially not to the treatment of the acute or early stage.

12. If the Government takes the responsibility of rejecting the advice implied in this report and decides to allow the Kenny clinics to remain, the commission strongly urges that they be placed under the control of a competent orthopaedic surgeon or surgeons, with the object of rejecting obviously hopeless cases, of avoiding the cruelty of disappointed hopes, of saving public money, and in general of getting a sane and balanced view of the patients' possibilities.

13. The commission also urges that the reeducative care of paralysed or paresed muscles needs a highly trained staff, that attendants at paralysis clinics should receive practical training in anatomy and physiology, and that some adequate standard of general education should be demanded from those undertaking the care of cripples at the clinics.

14. Where no further improvement in the condition of the cripple can reasonably be expected, the commission urges again that attention be directed to vocational training and especially to the provision of employment.

Birth Palsy.

Clinically, birth palsy is strictly comparable with poliomyelitis. All references to the reeducative treatment of the latter disease apply exactly to that of birth palsy, with even more stress on the necessity of proper splinting.

The commission records with regret that owing to ill-health Dr. McDonnell has been unable to take part in its work for more than twelve months.

Further, Dr. Leslie Gibson, honorary orthopaedic surgeon of the Brisbane Hospital for Sick Children, whose services to the commission have been invaluable, is at present very seriously ill and unable to sign this report.

C. A. THELANDER, M.B., Ch.M., F.R.A.C.S.
(Chairman).

J. V. DUHIG, M.B.

L. J. JARVIS NYE, M.B., Ch.M.

ALEC E. PATERSON, M.B., Ch.M.

R. S. LAHZ, F.R.C.S. (Ed.), M.B., Ch.M. (Ed.).

APPENDICES.

Appendix A.

Description of Treatment by a Masseuse.

This patient is a case of anterior poliomyelitis.

The child is now able to walk and is wearing a short iron with the boot blocked at a right angle.

For treatment the child is placed upon a plinth and the boot and iron removed. There is considerable wasting of the affected muscles and the leg and foot are cold.

If available, the limb is put into a whirlpool bath for about 20 minutes or an infra-red lamp is placed over the leg and heat in this form is given for 10 to 20 minutes. This heating increases the response of the muscles to slight impulses down their motor nerves. The weakest muscles work only when the part is warm. Massage loses half its benefit if given before the limb has been warmed by radiant heat or hot water. When the leg is quite warm, the heat is switched off or the leg taken out of the pool and massage is given to the whole limb in order to improve the venous and lymphatic circulation by deep upward stroking and gentle kneading of the muscles. The joints of the toes and ankle are then put through their full range of movement, care being taken not to stretch the paralysed and weak muscles.

How the reeducation is begun:

The first stage consists in training the anterior tibial group with gravity assisting.

The patient lying prone, knee flexed to a right angle, foot dorsiflexed and held supported by the masseuse so that only work in the inner range is possible. The patient is instructed to extend toes a little further and then to hold while masseuse gently brings them back to original position. In this way both concentric and eccentric work is given.

The ankle is then moved in the same way. The foot is inverted and supported and the patient asked to draw foot up and in a little further.

The work of the recovering muscles must be increased as the muscle responds to treatment.

First stage—gravity assisting.

Second stage—gravity eliminated.

The patient lying on his side with foot on highly polished reeducation board, foot slightly dorsiflexed, is asked to dorsiflex fully.

Third stage—gravity resisting.

The patient sitting on plinth with foot resting on a stool. He is asked to raise his toes, then his foot, so that only his heel remains on the stool. Progression is made from one stage to another and finally resistance work is given.

A further progression may be made by placing the limb in various positions and adding resistance, which is given by the masseuse.

Reeducation under water is a very valuable treatment. The muscles are trained in the same manner as when on a reeducation board—concentric and eccentric work in the inner range. Gravity is, of course, eliminated by the immersion in water.

The efforts are made several times, the patient moving the sound foot at the same time, and is encouraged by the masseuse to try to feel the same movement in the affected foot. Encouragement is given, and even though no contraction is observed the patient understands that the thought of the correct movement and the effort to obtain it will be necessary probably for months before any movement can be either felt or seen.

Four to six contractions are given to each muscle, care being taken not to tire the weak muscle. Never at any time must a recovering muscle be overworked. Quadriceps contractions are given. The foot is then held supported while the patient flexes and extends the knee, flexes the hip, abducts and adducts the hip. Internal and external rotation is given against slight resistance, and circumduction of the hip is performed passively. Massage of the whole limb is given for about five minutes to finish the treatment. The boot and iron are then replaced.

Further exercises can now be given for the muscles of the hip and thigh. Standing on the sound foot, leg swinging forward and backward and similar exercises. A plaster splint supporting the foot at right angles is worn at night. The principal precautions are never to tire a muscle and never to stretch the weak ones by putting the joint through a very wide range of movement.

Appendix B.

Review of Miss Kenny's Text-Book by Dr. Lennox Teece.

B.M.A. House,
137 Macquarie Street,
Sydney.

1st October, 1937.

Dear Dr. Thelander,

I have read with close attention Miss Kenny's book on the subject of "Infantile Paralysis and Cerebral Diplegia" and am pleased to offer your commission my views as to the principles and treatment laid down therein.

It is obvious from the most cursory examination of this book that Miss Kenny is a woman of enthusiasm, energy and organising ability. These faculties are all of tremendous importance in the treatment of all forms of paralyses. Treatment as advocated by her consists purely and solely of muscular reeducation which has always been accepted by all orthodox medical opinion as the most essential part of treatment both in infantile paralysis and in spastic paralysis.

Every new campaign in the treatment of disease possesses the undeniable advantage of stimulating enthusiasm and energy both in the near relatives of the patient who are responsible for seeing the treatment is carried out and also those who actually have charge of this treatment. Miss Kenny's clinics, therefore, started their work under most favourable auspices in this respect.

The facilities provided for constant, regular, and systematic treatment must have been most valuable to the patients. These facilities, if provided for the clinics already in existence before Miss Kenny began her work,

would have been equally valuable. It has been the experience of the medical officers in charge of previously existing clinics that one of the gravest difficulties they have to encounter is the carelessness and the apathy of the children's parents. This handicap, combined as it usually is with lack of adequate funds, adequate staffs, and adequate transport difficulties, has always tended to greatly hamper treatment. The patients under Miss Kenny's care have, fortunately, not had their treatment hindered by these disadvantages. The provision of an adequate staff able to give daily treatment, together with transport facilities to bring the children to the clinic, must have been of immeasurable advantage, and these factors alone apart from any special technique claimed for the treatment given in the clinic would account for an appreciable amount of increased efficiency.

If all the clinics in the Commonwealth were endowed with equal funds and equipped with staffs who could devote their entire energy to the treatment of the various forms of paralysis and if transport facilities were provided to bring the children regularly for the necessary treatment, I have no doubt but that the results of treatment would be better than they are today.

Miss Kenny lays down the general principles of her treatment in page three of her book under five headings. Four of these have been generally accepted and advocated for many years by the entire medical profession who are concerned in the treatment of these cases. The fifth alone, namely, "the avoidance of the accepted methods of immobilisation", departs from the practice that has been generally carried out. Thus, one may say fairly that the treatment she advocates is 80 per cent. orthodox. She does not profess to offer any new principles of treatment whatever, but merely to carry out more constantly and with a more individually trained staff the generally accepted principles of treatment. The adoption, therefore, of 80 per cent. of the methods which she advocates does not involve the acceptance of any new principles. It merely involves the provision of more adequate finance than has hitherto been available to the general public hospitals.

It is unfortunate that her book does not provide any adequate data from which results of her treatment can be evaluated. She states that she has had twelve recent cases of infantile paralysis all of which have been completely and permanently cured. If this is correct it is a remarkable result, but in order to estimate its true value we would require to know accurate details of these twelve cases. No details of any one of these cases are given to us. We do not know at all the extent of the paralysis; whether in any one case but one individual muscle was involved or whether the paralysis was extensive and produced complete paralysis of one or more limbs, and in the entire absence of any of these most necessary details one cannot offer any comment, favourable or adverse, on her results. It is most regrettable that the entire book contains not one single case history enabling one to trace the progress of any individual patient.

I would like to speak first of the views she holds in regard to treatment of cases of spastic paralysis.

In this type of paralysis splintage plays a negligible part, and inasmuch as her views only depart from the accepted methods in respect to splintage and immobilisation generally one may say definitely that her treatment as to spastic paralysis in no wise differs from the generally accepted treatment which has been carried out for many years. Her patients, however, have had the advantage of more intensive and regular reeducation than is generally possible in the clinics of the general public hospitals, and, therefore, one would expect them to have shown greater improvement than most such cases do.

If, however, sufficient finance be provided to give similar facilities to all patients no difference in the results between the different class of patient could be expected.

I have no criticism whatever, nor would the general body of the medical profession offer any such criticism, of her treatment of patients with spastic paralysis, inasmuch as this treatment is identical with the treat-

ment which has been carried out in general for many years in these cases of paralysis.

It is in her treatment of cases of infantile paralysis that discussion as to the merits or demerits of her system is called for.

As before stated, her only departure from the accepted methods of treatment is the avoidance of immobilisation. Unfortunately, she has given way to considerable overstatement as to the degree of immobilisation which is generally practised. The best informed orthopaedic opinion is not in favour of prolonged complete immobilisation of paralysed limbs. It does advocate the protection of paralysed muscles from continued over-stretching. Her opposition to immobilisation of paralysed limbs apparently arises from a fear that the joints will become stiff if immobilised. Fortunately, it is well recognized that the joints of paralytic limbs in cases of infantile paralysis in young children do not become stiff from immobilisation.

The deformities which occur in infantile paralysis are due, not to prolonged splintage, but rather to the absence of splintage. The active muscles which are unopposed by their paralysed antagonists gradually draw the limb into a deformed attitude in which it becomes fixed, and all the common deformities met with in infantile paralysis, such as fixed flexion deformity of the knees, paralytic *talipes equinus* and *equino-varus*, are due to the absence of splintage, the absence of support and relaxation of the paralysed muscle. The deformed attitudes assumed by a paralytic limb are not those in which a limb is splinted; thus the paralytic *equino-varus* is due to paralysis and lack of protection of the paralysed dorsiflexors and evertors. A totally paralysed limb is never splinted with the foot in *equino-varus*.

Orthodox medical opinion does not favour splintage a limb absolutely and avoiding all movement after the acute stage of the paralysis is over. Rather it encourages active movement of those muscles which possess voluntary power, whilst at the same time some support is applied to the limb to prevent continued over-stretching and elongation of the paralysed muscles. To prevent the development of these attitudes of deformity Miss Kenny advocates daily movement, these movements, of course, being of a passive nature where no active power is present. The development of these fixed deformities might be avoided if these passive movements could be carried out through the patient's entire life and were carried out several times daily; such a course is, naturally, not practicable. She does not enter into any discussion or any argument directed against the generally accepted view that habitual over-stretching of paralysed muscles is harmful to their prospects of ultimate recovery. In this respect, therefore, she does not present any arguments which require either consideration or rebuttal; but it is the generally accepted view, and this has been many times supported by my own experience, that continued over-stretching of paralysed muscles is excessively harmful to their prospects of recovery.

Every orthopaedic surgeon has seen many cases in which habitually over-stretched muscles in cases of infantile paralysis have shown no voluntary power, but shortly after these muscles have been protected and supported and kept rested by the application of some appliances which prevent this continued over-stretching, they have begun to show increasing voluntary power.

Though she expresses herself as unreservedly opposed to any immobilisation or splintage of paralysed limbs, it is to be noted that in the text of her work she does at times advocate the temporary application of splintage. However, the degree of splintage which she advocates is of so short duration as to be entirely inefficient; she mostly limits its application to a period of about half an hour daily. If, however, she is unreservedly opposed to the application of any splints whatever and considers such treatment is harmful, I am at a loss to understand why she should be in favour of even the short period of splintage she does recommend.

One must remind the commission that medical opinion in general does not favour a prolonged complete immobilisation of a paralytic limb. The general view held today

is that as soon as the acute stage is past active movements of all muscles should be carried out, and these movements should be constantly and diligently reeducated. At the same time appliances should be employed which will enable the patient to walk and will at the same time protect the paralysed muscles from continued elongation and over-stretching. Even, however, should complete immobilization be carried out for an unduly long period, though this procedure would delay the necessary muscular reeducation, it would not and never does result in actual joint stiffening. It might possibly result in actual joint stiffening if the patient were an adult, but in my experience covering over twenty years I have never known the joint of a child affected with infantile paralysis become stiff from prolonged immobilization.

In considering the common attitude of deformity it is interesting to note that the position of rest which she advocates prescribes that the foot should be at right angles to the leg. Now, in many cases of infantile paralysis this attitude can only be maintained by the assistance of some device, such as toe-raising spring. Whether the patient be recumbent in bed or erect upon his feet, in the presence of paralysis of the dorsiflexors of the ankle a drop-foot deformity will assuredly develop unless the foot is adequately splinted. The splints and supports which are generally used do not, as she appears to believe, favour the strong muscles at the expense of the weak or paralysed ones; all such supports, if efficiently designed and applied, have for their purpose the protection of the weakened paralysed muscles against continued over-stretching and elongation.

One must mention the fact that in all cases of spastic paralysis, whatever line of treatment be adopted, it is probable that this treatment will be accorded some credit which is not really due to it, inasmuch as some of the progress which is noted occurs equally in cases where no treatment whatsoever is carried out. It is the general experience that most cases of spastic paraplegia ultimately learn to walk in some sort of fashion even though no treatment whatsoever is carried out; though the assumption of the erect posture and the ability to walk do not appear until a much later age than in normal children. Therefore, if treatment is carried out during this stage this treatment will receive some welcome though unmerited credit.

In conclusion let me state that with the greater part of the principles of treatment as indicated by Miss Kenny I am in complete accord. It is the regular treatment which has been consistently advocated by all experienced orthopaedic surgeons for many years. Unfortunately, this treatment has not been carried out so completely and so efficiently as we could have desired, inasmuch as lack of funds has prevented the clinics of the public hospitals from providing a sufficiently large trained staff and has prevented their present staffs from devoting adequate time to these cases, and the absence of transport facilities has hampered the regular attendance of the patients. If these disadvantages were overcome, and it is only the question of money which prevents them being surmounted, the existing clinics of all the hospitals would function more efficiently. Unfortunately, Miss Kenny's clinics do not offer anything new; they merely carry out well-tried and long-practised principles of treatment. The only respect in which they depart from the accepted and normal practice is the more or less complete avoidance of splinting and support to paralysed muscles. This departure from normal practice is distinctly a retrograde step and is calculated to hinder the recovery of cases of infantile paralysis. The inefficiency of her treatment in this respect is, however, possibly counterbalanced by the more systematic, concentrated, enthusiastic and regular muscle reeducation which has been made available to her patients as the result of the provision of more adequate financial arrangements than have been available to the general run of public hospital patients.

Yours faithfully,
(Sgd.) LENNOX G. TEECE.

Appendix C.

*An Article Entitled "Treatment of Spastic Paralysis",
"The British Medical Journal", page 414,
August 28, 1937.*

The commission read with much interest an article published in *The British Medical Journal* of August 28, 1937, written by F. H. Mills, M.B., B.S. In this article the author refers to 370 cases of spastic paralysis which were treated by the Kenny method and which were, presumably, under his observation. (It is not clear in what capacity the author observed these cases; nor is it clear how many there were, for in another section of the article 200 cases are mentioned.)

The following claims, *inter alia*, are made by the writer:

(1) "No published results we know of can compare with those achieved in Australia." (Presumably by the Kenny method.)

(2) "Only three cases in the series of 370 patients [or 200, see above] needed tenotomy."

(3) "Stöffel's operation causes eventually an increase in spasticity in the muscles that have been partially denervated."

(4) "We do not advise certain forms of therapy for the following reasons:

Electro therapy . . . Massage because it increases the tone of spastic muscles, especially if applied to the receptive areas; and also passive and active movements of the joints of the extremities, for by stimulating the stretch reflex, they too cause heightened tone of the muscles. Splinting and bracing is also avoided as much as possible. It is harmful in the extensor group of muscles and the more distal muscle groups, but at times may be used advantageously in inhibiting spasm of a proximal group of muscles, usually flexors, for example, the hamstrings. In these proximal flexor groups the lengthening reaction is elicited and is not harmful."

(5) Following the above the author later remarks that the patient is placed in a warm bath and "at the same time the affected muscles are gently manipulated. This stimulus is a powerful inhibitor of muscle relax . . . at the same time the patient is asked to relax and breathe deeply."

These claims need comment. In respect of:

(1) The commission is not aware of a series of 370 (or 200) spastic patients treated by the Kenny method. The author does not state where these cases were treated in Australia. The commission is surprised to learn that Dr. Mills has been associated with the Kenny clinics in the treatment of this disease over a period of at least two years (as one would gather from the article). Although the commission has pointed out that the Kenny method of treating paralysis has some favourable features, the commission does not agree that no published results can compare with those achieved by the Kenny method.

(2) The commission is amazed that this remarkable series has never been brought to its notice, and finds it hard to believe that in a series of 370 (or 200) consecutive unselected cases of spastic paralysis only three needed tenotomy (or neurectomy, which the method condemns).

(3) To the anatomist and orthopaedist this statement is so ridiculous as to need no further comment.

(4) Here the author condemns practically every method of helping spastic muscles, including important active and passive movements and splinting, which, miraculously, is beneficial to proximal muscle groups and harmful to distal groups; they cause spasm in the latter and relaxation in the former.

(5) The writer here recommends manipulation of the affected muscles. This term is not understood by the commission, for, as pointed out above, he condemns massage and active and passive movements. This manipulation, which is not explained, reduces spasm (*sic*), while massage, he contends, increases spasm. The commission finds little reason to recommend massage for spastic paralysis, and it would be interested to know the nature of these manipulations.

(6) The commission, moreover, is sure that it has collected evidence from every available authoritative source. Dr. Mills's connexion with the Kenny method has never come to its notice, in spite of the fact that he here bears witness to these astounding results. The commission doubts whether 370 cases of spastic paralysis have been (or are) under treatment by the Kenny clinics; it strongly doubts, too, whether Dr. Mills has had these 370 (or 200) cases under his observation. In no spirit of carpentry, the commission, which has investigated all aspects of the Kenny methods, really finds the claims in this article confusing and unsubstantiated, and considers it remarkable that such should be published in a reputable medical journal.

Appendix D.

A report of a committee of the British Medical Association of New South Wales has just been received (December 9, 1937) and is here appended. This report was issued June, 1936, but was not made available to this commission earlier, as the Secretary of the British Medical Association stated they had not Miss Kenny's sanction. It is now issued on Miss Kenny's instruction.

Sister Kenny Clinic.—The Council of the British Medical Association, New South Wales Branch, received an invitation from Sister Kenny to appoint representatives to visit the clinic under her charge at the Royal North Shore Hospital, and to witness a demonstration of her methods of treatment of cases of infantile paralysis and spastic paralysis.

The committee appointed by the Council were as follows: Dr. E. H. M. Stephen, Dr. W. Vickers, Dr. R. B. Wade, Dr. L. A. Dey and Dr. R. V. Graham.

The committee was received by the Medical Superintendent of the Royal North Shore Hospital, Dr. C. S. Graham, Dr. H. H. Harrison (medical officer of the Elizabeth Kenny Clinic) and Sister Kenny. Dr. H. G. Wallace, Acting Director-General of Public Health, Dr. W. Wilson Ingram, Dr. D. W. H. Arnott, Dr. E. M. Humphery and Dr. A. L. Ducker were also present.

Sister Kenny gave a short description of the principles of her methods and personally demonstrated the actual procedure adopted. On May 28 cases of infantile paralysis were demonstrated, and on the second visit (in June) cases of spastic paralysis.

Report of the committee:

The committee was favourably impressed with the clinic. It was well-organized and well-equipped, and conducted with enthusiasm. There was sufficient staff to cope with the number of patients. The meticulous care displayed, particularly in the treatment of spastic paralysis, was specially noted with approval.

The treatment as seen did not differ in principle from that adopted in current practice. There were, however, variations in methods. From a single visit it is impossible to say definitely whether these were an improvement or otherwise, and only an investigation over a considerable period of time would be of value in assessing their comparative usefulness.

The method is essentially reeducation preceded by heat to improve the circulation of the limb and so the nutrition of the muscles. Exercises under water are a feature of the method.

The particular advantage due to the fact that patients were conveyed to the hospital, remained there until the treatment for the day was completed and were then transported to their homes was duly appreciated.

It is recognized that no form of treatment has yet been devised which can restore function in muscles, the nerve centres of which have been destroyed by infection with poliomyelitis.

The committee agreed that the Elizabeth Kenny Clinic at the Royal North Shore Hospital is doing valuable and useful work, but at the same time is confident that results no less satisfactory are being obtained in those institutions having facilities for

prolonged and continuous treatment. Furthermore, they were of the opinion that to achieve the best results obtainable it is imperative that the care and treatment of cases of paralysis should only be entrusted to attendants who have had special education in the anatomy and function of muscles. Such adequate knowledge in these subjects can only be obtained in a course similar to the massage course at Sydney University, which lasts two years.

The committee considers that the six months' special training in such a clinic as this is not sufficient to equip a nurse who has otherwise only had training in general nursing. Also the committee is convinced that there is a risk of the development of deformities in certain cases if adequate splintage is not carried out. In many cases such splints allow the patients to use the muscles whose function has returned even in part, in a way that would not be possible without them.

The committee has been given to understand that in the Elizabeth Kenny Clinic the use of splints has been abandoned. If this is the case the members of the committee consider that such a course is to be deprecated for the reasons given above.

The committee would like to make the following recommendations for use in clinics for the treatment of cases of poliomyelitis and spastic paralysis:

1. That the staff shall have an adequate knowledge of the anatomy and function of muscles.
2. That the department should have adequate equipment in baths, cubicles, tables *et cetera*.
3. That provision should be made for continuity of daily treatment for as long as necessary. This can be obtained: (a) by an adequate system of transport, (b) by the establishment of cripple schools and hostels.
4. That provision should be made for adequate splintage.

Appendix E. Recommendations.¹

Sister Kenny has fulfilled a useful service to the community in having aroused the Government authorities and public opinion in her effort to effect the organized treatment of the paralysed section of crippledom, and by having introduced to Australia the genesis of a scheme for the training of orthopaedic nurses. With regard to the latter, the committee considers that it is insufficient to train a general nurse in the technique of muscle reeducation alone, and that the minimum requirements should be three years' training and experience as a ward nurse in an orthopaedic hospital. This should be followed by eighteen months' intensive training in massage, general physiotherapy, and splintage, after which the trainees can be directed to the department which best suits their capabilities.

With regard to the conduct of the clinic, this committee considers that the present arrangement is not in the best interests of the patients, as there does not exist the close and continuous contact between patient and orthopaedic surgeon which is essential for a full understanding of the progress of each case.

The committee does not consider it possible to form a final and complete conclusion from the results of the treatment of the types of paralysis as carried out at the Elizabeth Kenny (New South Wales) Clinic by the examination of these twenty-five cases, mostly of a chronic nature, during such a short period of time as fifteen months.

Nevertheless, as a result of—

- (1) The examination of these twenty-five cases.
- (2) The fact that Sister Kenny has been able to obtain the requirements for her methods of treatment, namely, financial assistance, accommodation, appliances, personnel and transport facilities.

¹ Although it is not stated in the report, it must be presumed that the recommendations in Appendix E are those of the committee mentioned in Appendix D.—EDITOR.

(3) A study of the methods set out in the publication "Infantile Paralysis and Cerebral Diplegia—Methods Used for the Restoration of Function by Elizabeth Kenny", 1937.

This committee considers that instead of attempting to enlarge further upon the benefits and shortcomings of the methods advocated by Sister Kenny, it can best express its opinion by outlining what is considered to be the ideal scheme for the prevention, treatment and rehabilitation of cripples, and by showing how Sister Kenny's trainees can be absorbed in such a scheme. Such schemes are existent in many districts in England, and we would refer to the Shropshire Orthopaedic Hospital, England, as an outstanding example of such schemes.

Such a scheme envisages the creation of an open-air orthopaedic hospital of not less than 300 beds (public, intermediate and private) in spacious grounds in a district to be carefully selected. The actual amount of accommodation would be determined by the collaboration of the figures of the number of cases obtained from the New South Wales Society for Crippled Children, the Far-West Health Scheme, and the orthopaedic departments of general hospitals. In this connexion the census of crippled children compiled some years ago, and in the possession of the societies dealing with this problem, would be of value. In such a hospital paralytics of different types can be segregated and receive efficient treatment.

Within the hospital grounds there would be: (a) a hostel for the housing of ambulant cases, (b) a school, (c) occupational therapy workshops, (d) occupational training workshops and school, (e) a splint factory.

This hospital would be staffed by:

1. Consulting orthopaedic surgeons, to whom an honorarium should be paid because of the time-consuming nature of the work and to ensure that experienced surgeons would apply for appointment.
2. A medical superintendent especially trained in orthopaedic work, splint work and muscle reeducation; and a staff of resident medical officers.
3. A matron with special qualifications for such a specialty hospital.
4. Nurses and masseurs as required. In this department the personnel already trained by Sister Kenny can be absorbed, although in the future it would be preferable that the hospital train its own staff and thus produce a continuity of ideas and practice.
5. Teachers in the school and workshops, and splint-makers would also be necessary.

In such a hospital cases requiring prolonged and specialized treatment can be admitted at the outset of the complaint and remain within the hospital grounds until no further improvement is to be expected or until they have been trained in work commensurate with their disability, so that they become wage-earners instead of pensioners.

The present methods in Australia interfere with schooling for the purpose of treatment, and restrict treatment on account of education, whilst the fulfilment of a scheme as set out would allow treatment and education to be carried out in a more efficient manner.

In order to obtain the optimum recovery in cases of paralysis (infantile, spastic and others) this committee is of the opinion that efficient splinting and repeated (twice or thrice daily) reeducation of muscles are essential, and that it is practically impossible to give such efficient treatment unless the patients are constantly under expert supervision, preferably in the orthopaedic hospital as outlined above.

As an extension of such a scheme, clinics would be established in surrounding districts, and at regular intervals a person trained in this work and connected with the hospital should examine cases which have left the hospital and report any deformity or other orthopaedic abnormality and advise in the matter of necessary repairs or adjustments of splints.

Reviews.

THE SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM.

The publication of the second edition of the monograph by Gask and Ross so soon after the appearance of the original work is an indication of the popularity of the book, and furthermore, it enables the authors to present the results of their human experiments in a more complete form.¹ It also allows an evaluation of late effects which was not possible in the earlier work.

The enthusiasm for operative interference on the sympathetic nerves has passed through its earlier somewhat unbridled phase, the indications for such operations are becoming standardized and the results obtainable in various diseased states may be more or less accurately predicted. The most important changes in this edition are the modified views on the value of sympathetic ganglionectomy in Raynaud's disease. The original claims made for unqualified success of this operation in Raynaud's disease and allied conditions have been modified, and the authors have done a signal service in classifying these conditions and in indicating the group in which benefit may be expected after sympathectomy. The careful analysis of their own cases has enabled them to state summarily that advanced Raynaud's disease with ulcerative change of the fingers may be ameliorated, but not cured, by sympathectomy. The return of the abnormal colour changes of Raynaud's disease some months after sympathectomy is disappointing to the patient, but pain is in most cases relieved. With proper selection of cases, relief but not absolute cure, may be promised to many sufferers from this disease.

The underlying pathological process is responsible for the incomplete cure. The claim of some writers that inadequate anatomical removal of sympathetic nerves is the reason for the increasing number of published records of failure of the operation, will not bear the scientific scrutiny of the authors. This is an example of the need for considering a disease in all its aspects if treatment is to be effective.

Nineteen pages of the book are devoted to the discussion of periarterial neurectomy. Several dramatic results of this simple operation are quoted by the writers. They deprecate the tendency to discard a relatively minor procedure simply because its anatomical and physiological basis cannot be explained.

Cases of scleroderma and of *thrombo-angitis obliterans* have not been strikingly benefited by sympathectomy. Careful pre-operative tests of vasomotor spasm are insisted upon before sympathetic ganglionectomy is undertaken. "Thorotrust" injections of the femoral artery and radiographic studies are commended in doubtful cases.

A plea is made for the more extensive trial of sympathectomy in rheumatoid arthritis and osteoarthritis. An excellent chapter on disorders of the visceral motor mechanism brings up to date a collection of reports on this interesting subject. The value of sympathectomy in Hirschsprung's disease, dysmenorrhoea, cord bladder and nephralgia is carefully and judiciously discussed.

Pain and its relief by sympathectomy have been the subjects of many contributions to the literature. The authors mention patients apparently cured of causalgia by sympathectomy, but one is left with the feeling that many of such claims by enthusiasts are "not proven". Alcohol injection for *angina pectoris* is not recommended by the authors. Recent anatomical researches on the autonomic nervous system are critically reviewed and the work and conclusions of Lewis have obviously been a balancing influence in guiding the authors.

This is a typically British monograph—restrained, yet not blindly conservative, devoted to the surgery of the sympathetic nervous system, yet sanely concluding on a philosophical note—a discussion of temperament.

¹ "The Surgery of the Sympathetic Nervous System", by G. E. Gask, C.M.G., D.S.O., F.R.C.S., and J. P. Ross, M.S., F.R.C.S.; Second Edition; 1937. London: Baillière, Tindall and Cox. Super royal 8vo, pp. 198, with illustrations. Price: 16s. net.

The Medical Journal of Australia

SATURDAY, JANUARY 29, 1938.

All articles submitted for publication in this journal should be typed with double or triple spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE STATE AND THE MEDICAL PROFESSION IN QUEENSLAND.

DISCUSSIONS on medico-political problems may be dull affairs to the average practitioner in medicine who is concerned primarily with the care of people seeking his advice. If discussions appear dull it is generally because those taking part are dull dogs devoid of imagination who present the subject in a dull fashion. No one would, of course, suggest that a medico-political subject could be inherently dull. A discussion not easily forgotten was held on February 7, 1934, at Philadelphia, United States of America. The occasion was a conjoint meeting of the College of Physicians of Philadelphia and the American Academy of Political and Social Science; the meeting consisted of three sessions, and the subject for discussion was "The Medical Profession and the Public: Currents and Counter-Currents". Those who read papers were the following: James H. S. Bossard, Ph.D.; N. B. Van Etten, M.D.; Edgar Sydenstricker; Henry E. Sigerist, M.D.; Grant Flemming, M.D.; Roger I. Lee, M.D.; M. M. Davis, Ph.D.; Thomas Parran, junior, M.D.; Morris Fishbein, M.D.; W. F. Foster, LL.D. The subject was approached from every point of view, and the papers, which were published as a brochure, make

most interesting reading. On some aspects considerable divergence of opinion was expressed, but the general impression left with the reader is that times are changing, that the type of medical practice of olden days is not suited to present-day needs, and that if these needs are to be met some radical change will have to be made in the mutual relationships of the State, the members of the medical profession and the public. In 1934 these facts were possibly not recognized so widely as they are today, when in England and Australia the profession itself is striving through the British Medical Association for the adoption of schemes which will give adequate medical service to every member of the community. Be that as it may, it will interest members of the medical profession in Australia, particularly those resident in Queensland, if we reproduce *verbatim* some of the views expressed by certain of the speakers at the Philadelphia conference.

Dr. Thomas Parran, junior, Commissioner of Health of the State of New York, quoted Sigerist as follows:

There is one lesson that can be derived from history. It is this: that the physician's position in society is never determined by the physician himself, but by the society he is serving.

Then he continued:

It is time that men should look to physicians themselves for guidance upon medical matters of public concern as well as those of private urgency. Nevertheless, the direction and distance we can lead toward a specific type of health service for tomorrow is limited sharply by the framework of tomorrow's social concepts . . . Whatever the path we take, regardless of how earnestly as doctors we may fight for it or against it, the health service of tomorrow inevitably will conform to whatever is the governmental framework . . . It is no longer easy to secure applause by damning the government because of its interference, without valid evidence that alone and unaided by government we can do a better job.

Dr. James H. S. Bossard, Professor of Sociology in the University of Pennsylvania, spoke as a non-medical person, a sociologist, looking at doctors. Speaking of former days, he said:

Time was when health, sickness and the work of the doctors were regarded almost entirely from an individual viewpoint.

He then discussed the changed attitude and the factors contributing to it:

The first of these has been the development of health work in the schools . . . To physical examination have been added follow-up work for the correction of defects, systematic immunization against communicable diseases, the improvement of school sanitation, provision for the safety of children, and in many cities, nutrition work involving the actual feeding of undernourished children. In other words there has grown up now a generation who, through the schools, have become accustomed to a reasonably adequate and free health service.

Referring to army medical service, Dr. Bossard said that disease was controlled far more effectively in the camp than in the market place.

This was particularly true during the World War, with the result that millions of young men who had become accustomed to a partial and free health service in the schools, had that experience continued and enlarged in the more effective health service which they received while members of our military forces. After demobilization, these men went into industry, and here again, the same sort of development has been going on. More than twenty years ago, the larger corporations began rendering health service to their employees . . . Most significant of all, perhaps, has been the marked tendency to provide not only for the worker but for members of his family as well.

Edgar Sydenstricker, Director of Research of the Milbank Memorial Fund, New York City (who, by the way, according to the Philadelphia report, is not a doctor) spoke on medical practice and public needs. He tried to find a solution to the problem and he began by discarding taboos:

The principal taboo which we must discard is that the provision of medical care is a mysterious and sacrosanct realm into which only the physician may enter and at whose portals all others must genuflect. . . . Society, for its own protection, has determined the qualifications of those who practise medicine and, having set these standards, has given physicians the right and imposed on them the duty to decide *what* shall be practised; society has left to the physician the content of medicine. But society always has had and always will have the power and the right to determine *how* medicine is practised, . . . how public health and welfare can best be promoted thereby.

The type of medical care is discussed by Dr. Parran; *inter alia* he remarked:

It is agreed that individual attention, whether preventive or curative, by a skilled and interested physician is the best type of medical care. We should each of us prefer it, just as we should prefer a special nurse and a private hospital room, if we could afford it, when we ourselves were ill. Yet if we cannot pay for anything better there is nothing inherently vicious about the general nursing service, the ward room, or preventive care and treatment in the clinic when otherwise the community and the individual would suffer from no service at all. . . . Further,

we can find skilful and interested physicians in the public service, who treat patients as well as problems; we can find unskilful, uninterested physicians in private service, to whom the patient is but a means for filling the pocket-book. The quality of any service depends upon the integrity and ability of its personnel. Neither public nor private medical service is all good or all bad.

Medical practitioners will straightway admit that much truth lies in these quotations; to the practitioners of Queensland, however, they will have a familiar ring. They were embodied (with a verbal alteration here and there to suit the context) in a remarkable document, "An Open Letter to Medical Men from Health Director-General", that was published in *The Telegraph*, Brisbane, on the evening of January 12, 1938. This "open letter" purported to be a plea for cooperation by the members of the medical profession with the Government for the health of all the people. In the letter certain solutions were suggested. For these suggestions acknowledgement was made to Edgar Sydenstricker (described as a doctor and "perhaps the most gifted of the investigators in this subject"). Sydenstricker summarized as follows the "principal approaches" that had been made in an attempt to find a solution to the problem:

1. By undertaking no definite or planned social action, but trusting to a process of evolution and more or less casual examination.
2. By the commercial organization of medicine and medical services on a large scale.
3. By making all medical services a governmental function.
4. By applying the principle of compulsory insurance on a state-wide or on a nation-wide basis.

There is no need to discuss these suggested methods, but it should be pointed out that Sydenstricker admits that there is no one solution and adds that the needs of the situation must be met by a combination of methods. The "open letter" concluded with a statement that every medical man in Queensland would shortly have the opportunity of determining whether he would or would not express his willingness to cooperate with the Government for the health of all the people, if called upon. The Director-General of Health added that he hoped that the members of the medical profession would recognize the professional side of the Department of Health and Home Affairs "as a

co-operative institution, anxious to effect a permanent and helpful liaison between the public and the profession".

The opportunity of declaring a willingness to cooperate with the Government was given shortly after the appearance of the "open letter", when every practitioner received the following communication by post:

URGENT.

It has been decided to ask for your co-operation to obtain a Trial Roster of all medical men in Queensland who are willing now or at a later date to undertake any of the several kinds of work set out below in association with the Department of Health and Home Affairs of this State.

If you are already employed in Government Service, whole or part time, or desire so to be, or are willing to be listed for approved part-time or auxiliary service, now or in the future, leave Yes in the corresponding square below, and strike out No.

If you are not willing to list your name now, or at any future date, for any of such services, leave No and strike out Yes in the spaces shown. A stamped and addressed envelope is enclosed and, subject to absence or other legitimate cause of delay, if a reply is not received from you within 7 days (main routes) or 14 days (outlying places), your name will be included among those declining enrolment.

R. W. CILENTO, Kt., M.D., B.S., D.T.M. and H.

11 January, 1938.

Are you willing, now or at any future date, if called upon, to enrol with the Department of Health and Home Affairs of the State of Queensland for (cross out whatever is not applicable)—

- | | | | |
|---|-------------|-----|----|
| (1) Full-time hospital work? | | Yes | No |
| (2) Part-time hospital work on a paid basis? | | Yes | No |
| (3) Part-time hospital work on an honorary basis? | | Yes | No |
| (4) Other institutional services? | | Yes | No |
| (5) Insurance practice (panel) or other approved system? | | Yes | No |
| (6) Preventive medical services other than those obligatory under the Health Act and Regulations? | | Yes | No |
| (7) Voluntary services with medical or social auxiliaries? | | Yes | No |

Signature

Date

Qualifications

If a reply is not received within the stated time, a negative will be recorded.

This whole procedure is one of the strangest that can be imagined. In the first place, as Dr. C. A. Thelander pointed out in an "open letter" to the Director-General of Health, also published in *The Telegraph*, there has been no indication whether the

procedure was carried out at the direction of the Minister for Health or not. Most people will presume that it was. In the second place the Director-General of Health has based his "open letter" on extracts from speeches made by men who were opposed to the American Medical Association because it was not prepared to approve of a scheme of national insurance for the United States of America. To address such remarks to Australian practitioners is absurd, for Sir Raphael Cilento knows full well, as does the Minister for Health, that the medical profession in Australia is, for better or for worse, wedded to a scheme of cooperation with governments in national insurance. They also know that the members of the medical profession in Queensland, acting through their official organization, the Queensland Branch of the British Medical Association, have formulated a scheme for medical service to the community—a workable scheme which would give to every individual in the State proper general practitioner and specialist services, a scheme of which we think even Edgar Sydenstricker would approve. The Queensland Branch Council has wisely advised members of the Branch that they may reply in the affirmative to all the questions in the circular letter, with the proviso that acceptance is subject to the qualification that the conditions of service are satisfactory and are approved by the Queensland Branch of the British Medical Association. It is a thousand pities that the Director-General of Health, when he wanted to compile a "trial roster", did not approach the Queensland Branch or, failing that step, that he did not communicate with each practitioner without seeking the publicity of an "open letter" in a newspaper. In the circumstances we may perhaps be forgiven for wondering whether the Director-General, when he wrote his "open letter", with its high-sounding Philadelphian phrases, was not confusing cooperation with acquiescence. He states that matters have now reached a stage when a definite policy must be evolved. The Queensland Branch asks for nothing better than cooperation with the Department of Health in service to the public; the invitation, however, should come from the Minister.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

A Chemical Study of the Blood of the Developing Chick.

CARLA M. ZORN AND ALBERT J. DALTON (*American Journal of Physiology*, July, 1937) have studied the progressive changes in concentration of blood constituents of the chick embryo from the ninth day of incubation until the third day after hatching. Eggs from white leghorns were employed throughout this study, and the incubation process was carried out under the optimum conditions. Eggs were then carefully opened and sufficient blood for analysis was withdrawn from the vitelline artery or vein into a one cubic centimetre tuberculin syringe. The following changes were found. The concentration of blood sugar was maintained at a reasonably constant level during the early part of the period studied. A rise toward the value for adults, first noticeable on the sixteenth day, became very pronounced at the time of hatching, reaching a level above the average normal adult concentration. The values for uric acid content of the blood rose continually during the period of incubation. The concentration of blood cholesterol rose rapidly from the ninth to the eighteenth day of incubation. A gradual decrease in the values followed this rise, reaching the normal adult level at the time of hatching. A secondary increase occurred immediately afterwards. The changes in haemoglobin and erythrocyte values were roughly parallel. The concentration of both constituents increased directly with the age of the embryo. The haemoglobin values were elevated above those of the normal adult during the latter third of the developmental period. The authors state that changes in the concentration of uric acid in the blood during the development of the chick have not to their knowledge been reported as occurring in the embryo. Other workers have estimated the amount of uric acid excreted per day per embryo. Their results indicate an increasingly rapid formation of uric acid in the embryo, which is well under way by the ninth day of incubation, and are thus in accord with the results of blood uric acid content recorded here.

An Experimental Study on Pernicious Anæmia.

FOLLOWING the experiments of Castle in 1928, which demonstrated the absence of a specific factor in the gastric juice of pernicious anæmia patients, numerous attempts have been made to localize the site of elaboration of the so-called intrinsic factor. Meulengracht and Ungleb found the active principle in the pylorus, but not in the fundus. Sharp and Meulengracht showed that the duodenum was

also active. The histological similarity of Brunner's glands to the pyloric glands led Meulengracht to suggest that these glands might be the site in the upper gastro-intestinal tract where the anti-anæmic factors were found. Petri and his co-workers were unable to produce the disease in dogs by removal of the stomach and the portion of the duodenum containing Brunner's glands. William H. Bachrach and Samuel J. Fogelson (*Proceedings of American Physiological Society, American Journal of Physiology*, June, 1937) have studied a group of dogs from which all of the pyloric and Brunner's glands were removed with the additional resection of sufficient intestine to remove the probable margin of safety. The operation consisted of excision of the distal three-fourths of the stomach, all of the duodenum and the first thirty cubic centimetres of the jejunum, the bile and pancreatic ducts being transplanted into the jejunum. Seven dogs have been observed for more than one year. Following the post-operative anæmia the blood picture has slowly returned toward normal. To date none of these dogs has shown any of the haematological, neurological or gastro-intestinal manifestations of pernicious anæmia.

The Liberation of Adrenin and Sympathin Induced by Stimulation of the Hypothalamus.

The investigations of Cannon and his co-workers have determined beyond question that during the widespread discharge of the sympathetic nervous system in emotional excitement, there is an increased secretion of adrenin which, liberated into the blood stream and distributed throughout the body, augments and prolongs the effects induced by direct nervous excitation. More recently the existence of another sympatho-mimetic hormone "which diffuses into the blood stream when sympathetic nerves supplying autonomic effectors are stimulated" has been identified by these workers. The liberation of these two hormones, adrenin and sympathin, during emotional activity renders of interest the demonstration of their production on direct stimulation of the hypothalamic region of the brain, whose importance in sympathetic innervation and emotional excitement has been shown in many other ways. H. W. Magoun, S. W. Ranson and A. Hetherington (*American Journal of Physiology*, July, 1937) have demonstrated the liberation of circulating adrenin and sympathin in response to stimulation of the hypothalamus, using the denervated nictitating membrane of the anaesthetized cat as an indicator. A long latent period and delay in maximum contraction of the nictitating membrane occurred in these experiments. This seemed to indicate that the circulation of adrenin and sympathin was not responsible for the initial effects of hypothalamic stimulation, though their accumulation as stimulation is continued must

certainly increase the magnitude of the other responses obtained. The authors conclude that the rôle of the hypothalamus in visceral innervation and emotional excitement is effected both by direct nervous influences and by humoral substances for whose release these nervous influences have been responsible.

Distribution in Body Fluids and Excretion of Ingested Ammonium Chloride, Potassium Chloride and Sodium Chloride.

JACQUES BOUDILLON (*American Journal of Physiology*, October, 1937) presents observations made during the first hours after oral administration of single doses of ammonium chloride, potassium chloride and sodium chloride, and correlates the changes observed in the composition of serum and urine with the now accepted views concerning the composition and volume of the intracellular and extracellular body fluids. These views, according to the author, may be summarized as follows. The extracellular fraction of the body fluid has approximately the composition of an ultrafiltrate of plasma, and in man contains most of the sodium and practically all of the chloride of the organisms. The tissue cell membranes are ordinarily impermeable to the ions, Na^+ , Mg^{++} , Cl^- , HPO_4^{2-} , SO_4^{2-} and SCN^- , and to sucrose; consequently, after an intravenous injection of a non-isotonic solution of one of these substances a new equilibrium is reached between extracellular and intracellular concentrations, not through exchange of these solutes, but through a movement of water. In the experiments here described single large doses of ammonium chloride, potassium chloride and sodium chloride were administered by mouth to a human subject, and the changes in serum electrolytes, interstitial fluid volume, and electrolyte excretion were observed for several hours. All experiments were performed after a meal. No food was taken during the procedure; water was administered with the salt in sufficient amounts to avoid nausea. No catharsis resulted. The changes observed suggest to the author the following conclusions. The increment in serum chloride concentration following the administration of each salt approximates that estimated by assuming that the retained chloride diffuses into the interstitial fluid only and does not enter the tissue cells. The increment in serum urea concentration following ammonium chloride administration corresponds to the value calculated by assuming that the retained nitrogen is entirely changed to urea, which diffuses into the total body fluids, both intracellular and extracellular. The increment in serum potassium concentration after potassium chloride administration approximates that estimated by assuming that the retained potassium, like urea, diffuses into the body fluids. Serum bicarbonate was reduced by acid decom-

position after ammonium chloride administration. After potassium chloride administration it was also reduced. About one-third of the fall in serum bicarbonate was accounted for by excretion of bicarbonate in the urine. For the other two-thirds the probable exit was by way of diffusion as potassium bicarbonate into the tissue cells, although the possibility of bicarbonate decomposition by accelerated acid formation in the body is not excluded. After sodium chloride administration serum bicarbonate was not appreciably affected.

BIOLOGICAL CHEMISTRY.

Sensitization with Chemical Compounds.

K. LANDSTEINER AND M. W. CHASE (*Journal of Experimental Medicine*, September, 1937) report results of further studies on the sensitization of animals with simple chemical compounds. The present communication deals with the production of anaphylactic reactions in guinea-pigs by intradermal inoculation with 2:4:6 trinitrochlorobenzene (picryl chloride) and 2:4:dinitrochlorobenzene—the latter a typical incitant of contact dermatitis in man. Repeated small injections of these substances produced true anaphylactic reactions, demonstrable by intravenous injection of protein conjugates and by the Dale technique, when the isolated uterine horns are used. Cutaneous sensitivity was demonstrated by superficial application of solutions of the test substances in olive oil. It is suggested that the anaphylactic sensitization is due to the formation in the tissues of antigenic protein conjugates following application of substances of simple chemical constitution, and that, since the anaphylactic state is induced by the same method of administration that gives rise to cutaneous sensitivity, the formation of conjugated antigens offers an explanation of the skin effects also. In the experiments with picryl chloride the presence of anaphylactic antibodies and occasionally of precipitins was demonstrated.

Globin Utilization in Formation of New Haemoglobin.

F. S. RONSCHEIT-ROBBINS AND G. H. WHIPPLE (*Journal of Experimental Medicine*, November, 1937) have investigated the importance of the globin fraction in the formation of haemoglobin by the dog made anaemic by repeated bleedings and fed on the bread-salmon diet. It had previously been shown that the standard anaemic dog could use sheep, goose or dog haemoglobin when given by the vein and return quantitatively its equivalent as new dog haemoglobin within the red cells. It is now shown that globin at times can be used when given by vein with a quantitative

return of new haemoglobin in the red cells. Sometimes the intravenous administration of globin will inhibit haemoglobin formation, and the toxic effects of injected globin are believed to be responsible for this. A tryptic digest of globin can similarly be used in haemoglobin formation. Horse and dog globin appear to act in an identical manner. Globin fed by mouth may return thirty to forty grammes of new haemoglobin from one hundred grammes of globin, compared with thirteen grammes of new haemoglobin from the feeding of one hundred grammes of liver protein. The globin radical of haemoglobin appears to be an important limiting factor in abundant haemoglobin building in this type of anaemia due to blood loss.

Survival of Depancreatized Dogs.

I. L. CHAIKOFF AND A. KAPLAN (*Journal of Nutrition*, November, 1937) have shown that completely depancreatized dogs, when maintained with insulin and a high-calorie, high-protein, high-vitamin diet, may survive for as long as four to five years. The completeness of pancreatectomy was confirmed at autopsy. This length of survival indicated that it was unnecessary to assume that raw pancreas, pancreatic extracts or choline supplements (that is, in addition to choline present in the dietary constituents) were essential for survival. Pathological changes (cataracts, blood lipid changes and fatty livers) in the depancreatized dog maintained with insulin indicate that survival does not occur under optimum conditions. The authors consider that previous failures to obtain lengthy survival on diets containing no pancreas were probably due to the use of faulty diets.

Pernicious Anæmia.

W. B. CASTLE, C. W. HEATH, M. B. STRAUSS AND R. W. HEINLE (*The American Journal of the Medical Sciences*, November, 1937) have reported further observations on the aetiological relationship between *achylia gastrica* and pernicious anæmia. Administration of mixtures of beef muscle and normal human gastric juice at pH 1.8 or 2.5 did not lead to the increased blood production in pernicious anæmia which occurred when mixtures of these substances were administered at pH 5 or 7. Since it was found that the intrinsic factor was not destroyed by the treatment with acid, it was inferred that the acid environment was unsuitable for an essential interaction between beef muscle and gastric juice. Further, since the inhibitory effect of acid would be largely confined to the alimentary tract, it was considered that the reaction between intrinsic and extrinsic factors occurred enterally rather than parenterally. The synthesis of a substance resembling in thermo-stability the active principle of crude liver extracts was

not effected *in vitro* by incubation of beef muscle with normal human gastric juice, with gastric juice and then with normal human duodenal contents, or with gastric juice and then with hog duodenal or small intestinal mucosa. Although evidence is lacking for specific *in vitro* effects, the authors consider that it is possible that the gastric intrinsic factor may be an enzyme active near pH 7, but not at pH values less than 2.5, and that if it is active *in vitro* its function may be the formation of a precursor of the thermo-stable active principle of liver extract.

Effect of Oestrin on the Basal Metabolic Rate.

M. E. COLLETT, J. T. SMITH AND G. E. WERTENBERGER (*American Journal of Obstetrics and Gynecology*, October, 1937) have studied the effect of administration of oestrin preparations on the basal metabolic rate and the nervous symptoms of women whose ovaries had been removed. Trained subjects, twenty-five to forty-two years old, who had been subjected to oophorectomy and hysterectomy three months to five years before observation, generally had a basal metabolic rate 12% to 20% below the Harris-Benedict standard. Oestrin in the form of theelin, theelol or amniotin had a decided effect on the basal metabolic rate, and if given in sufficient amount raised the level for some time after treatment. Oestrin was found to be effective when given by mouth. Amniotin produced more lasting clinical improvement than theelol. Accompanying the rise in the basal metabolic rate were decrease in the number and intensity of hot flushes, decreased nervousness and lessened fatigue. In some cases oestrin administration was followed by reappearance of vasomotor symptoms. Effects of treatment were cumulative and did not begin until several doses had been taken. Oral administration over a definite period was effective for a longer time than the injection of equivalent amounts over a shorter period.

Bromine in Nutrition.

P. S. WINNEK AND A. H. SMITH (*Journal of Biological Chemistry*, October, 1937) found no evidence that bromine was essential in the nutrition of the rat. A synthetic diet was prepared which supported growth and had a bromine content of less than five parts per ten million. The young of the rats on the synthetic diets (both basal and supplemented with bromine) were born living and normal in appearance, but did not survive. The amount of bromine in the tissues of the animals depended on the bromine intake and on the ratio of bromine to chlorine in the diet. Young born to mothers on a diet low in bromine had a greatly diminished bromine content compared with young born to females on the stock diet.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at Warragul on October 2, 1937, Dr. J. P. MAJOR, Senior Vice-President, in the chair. Part of the meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the West Gippsland Hospital. Part of this report appeared in the issue of January 22, 1938.

Surgery of the Prostate Gland.

DR. C. M. LEY showed two patients, aged seventy-five and seventy-four years respectively, whom he had under treatment for prostatic enlargement. The man shown first had been seen two years earlier because of retention of urine as a result of soft enlargement of the prostate. As he was very ill, with signs of cardiac and renal disease, he had been treated by means of an indwelling catheter and washouts with various bladder lotions; operation was contraindicated as the patient was such a poor operative risk. He had contracted a suppurative epididymitis which had gone on to abscess formation; and to relieve obstruction, permanent suprapubic drainage had been instituted. After drainage had been continued for three months the general condition of the patient had improved, and Dr. Ley invited opinions concerning the advisability of attempting to resect the prostate through a resectoscope.

The other patient shown by Dr. Ley had come under his care in January, 1937, at which time the bladder was up to the umbilicus; and on rectal examination it was considered that the prostate was malignant because it was very hard. Permanent suprapubic drainage had been the method of treatment adopted. Dr. Ley had learnt that six years earlier the patient had been treated at the Royal Melbourne Hospital by radium and deep X ray therapy for a hard mass in the left axilla which was reported to be a lymphosarcoma.

DR. H. MORTENSEN said that the patients shown by Dr. Ley illustrated two of the causes of bad risk in prostatic surgery: preexisting cardio-renal disease and malignant disease of the prostate. In his experience these patients as a type stood treatment with an indwelling catheter very poorly. It was his practice to drain the bladder by trocar and catheter under local anaesthesia. He was of the opinion that orchidectomy or vasectomy should be performed, because if epididymitis developed it usually caused suppuration, and, by turning the tide against the patient, might result in death. Orchidectomy should be performed promptly on the first sign of epididymitis. In most cases Dr. Mortensen considered that suprapubic cystostomy was a more serious operation than prostatectomy itself, and that if prostatectomy was performed in two stages the risk was greater for the patient. The possible lines to follow with patients like the first man shown by Dr. Ley were: (i) to leave them alone if they were in reasonable comfort or were satisfied with their outlook on life, (ii) to attempt complete prostatectomy if it was the wish of the patient to escape discomfort and if he was aware of the mortality risk, or (iii) to attempt to relieve obstruction by endoscopic or perurethral resection. Dr. Mortensen stated that in a very large proportion of his patients of this type he performed a resection. Multiple resections were not recommended, but it was not unusual to perform resection two or three times. Satisfaction with the procedure varied with dexterity and with the amount of prostate to be removed. With reference to complete prostatectomy, he considered anaesthesia to be very important. He had previously used spinal anaesthesia, but as the patient had to be tipped up for about nine hours, which was bad for the heart and interfered with the taking of drinks, he had adopted local anaesthesia as a routine measure. He used local anaesthesia down to the bladder, and with everything set for rapid action he got the anaesthetist to give the patient nitrous oxide gas for two or three minutes.

He did not attempt to elaborate haemostasis, and he had found that now and again the patient survived even when the pre-operative prognosis was very bad. Dr. Mortensen said that the second patient shown by Dr. Ley presented a very big problem. If the growth was not too massive, he considered that the best treatment would be by resection to promote the egress of urine. This performance could be repeated from time to time, and such a patient might go on till death without having the bladder opened. Of course if the bladder was already opened, as in the patient shown by Dr. Ley, there was no need for resection. The results of deep X ray therapy were equivocal and uncertain in these cases, and such procedures might even aggravate the pain.

Renal Calculus.

DR. LEY also showed a male patient, aged thirty-eight years, who three years earlier had undergone investigation for left-sided attacks of renal calculus; previously he had had renal colic with haematuria, and abdominal colic which had led to operation, at which an inflamed and perforated appendix was removed and peritonitis supervened. In a skiagram shown by Dr. Ley a single stone could be seen in the pelvis of the kidney. After carrying out a test of renal function he had removed the stone by pyelotomy and had placed a drainage tube down to the opening. The patient had got on quite well and the wound had healed without any trouble.

DR. H. MORTENSEN congratulated Dr. Ley on the result he had obtained, but reminded him of the necessity for strict post-operative care for months or years, on account of the great frequency of recurrence of calculi. In these cases it was necessary to control infection and to overcome obstruction. The degree of urinary acidity could be determined and varied by means of diet intelligently used. Infection and obstruction were important factors in the aetiology of renal calculi.

Perthes's Disease.

DR. LEY also showed a boy, aged nine years, who had been admitted to the hospital one week before the meeting. He had been mildly feverish for a month, with pain and wasting around the left hip joint. The left limb was half an inch shorter than the right one, and movement was limited in all directions at the left hip joint. It could be seen in the skiagram that there was flattening of the head of the left femur, with increase in density below the mushrooming; in addition, there was an increase in the width with a diminution in the length of the neck of the femur. Dr. Ley commented on the fact that they never seemed to be without an example of Perthes's disease at the West Gippsland Hospital, and that it did not seem to be necessary to adopt any other form of treatment beyond cutting out the weight-bearing during the active phase. He showed serial pictures of a patient he had been watching for ten years.

DR. KEITH HALLAM said that he thought that Perthes's disease was an unfortunate term to use. He had looked at the skiagrams, and he considered that the head of the femur was deformed, with a hump on it, but that there were no signs of fragmentation. There was slight subluxation of the head, and the acetabulum was slightly larger on the left side than on the right. Dr. Hallam commented that there was a tendency to use the term "Perthes's disease" to cover a multitude of symptoms due to trauma, as in reduction of dislocation or in slipped epiphysis. He asked what the surgeons were going to do about nomenclature in a case like that of the patient shown by Dr. Ley, when subluxation was present, but no change was evident in the bone.

DR. E. LEY said that in the matter of treatment he had found it to be the opinion in the north of England that the results of prolonged immobilization were no better than those of short immobilization, and that the results of all three stages were equally bad. The condition was a non-articular osteoarthritis, and he would not advocate

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any treatment at present other than rest and absence of weight bearing. At a later date a reconstructive operation might have to be undertaken.

Mutilated Hand of Worker.

Dr. C. M. Ley also showed a young timber-worker, who on his first day at work two months before the meeting had caught his hand in a saw, which had whipped through all the four fingers of one hand at the metacarpophalangeal joints of three fingers and into the muscles of the thumb, fortunately leaving a small piece of the little finger. The boy had lost a lot of blood. The *flexor longus* tendons had been cut through, and the metacarpals had been taken below the head; it had been impossible to pick up the proximal parts of the tendons. Dr. Ley asked for guidance concerning the advisability of a secondary operation to pick up the tendon of the *flexor pollicis longus*, which had been cut, to try and get approximation of the thumb and stump of the little finger.

Dr. J. B. Colquhoun congratulated Dr. Ley on the result that had been obtained. He said that the man had quite a useful hand, and if he used his head he would have a better hand later on. He advised Dr. Ley not to undertake any further operation until sufficient time had passed to decide whether it was necessary.

Dr. C. H. Osborn also complimented Dr. Ley on the result of what must have been a very unpleasant task. He also expressed the opinion that the hand was going to be very useful, and that a *flexor pollicis longus* action could already be elicited.

Dr. Ley replied that there was no doubt that the tendon of the *flexor pollicis longus* had been divided, and that if it was acting a happy "pick-up" must have been obtained.

NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Beckett, Charles Edward Halley, M.B., 1936 (Univ. Sydney), 283, Cleveland Street, Redfern.
Flynn, Gregory Stephen, M.B., B.S., 1935 (Univ. Sydney), 135, Macquarie Street, Sydney.
Frost, Alan Dudley Joseph, M.B., B.S., 1936 (Univ. Sydney), 16, Birriga Road, Bellevue Hill.
Mathieson, John Bryan, M.B., B.S., 1937 (Univ. Sydney), Sydney Hospital, Sydney.

The undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Bonnin, Josiah Mark, M.B., B.S., 1936 (Univ. Adelaide), Adelaide Hospital, Adelaide.
McLarty, Thomas Leslie, M.B., B.S., 1935 (Univ. Adelaide), North Terrace, Adelaide.

The undermentioned have been elected members of the South Australian Branch of the British Medical Association:

Thomson, Alexander McQueen, M.B., B.S., 1937 (Univ. Adelaide), 4, Alpha Street, Kensington Park.
Miller, Malcolm William, M.B., B.S., 1932 (Univ. Adelaide), M.R.C.P. (London), Freeling.

Correspondence.

MANIPULATIVE SURGERY.

SIR: I was extremely interested to read Dr. W. Kent Hughes's remarks on this subject, and they are disquieting, particularly to those interested in or responsible for medical education.

There is no gainsaying the fact that manipulative surgery (and physical therapy generally) have for long been the Cinderellas of the surgical branch of the art of medicine.

I have given much thought and attention to the question as to how medical students may best be given the opportunity of acquiring something of the art of manipulative surgery. I am not aware of any help that may be forthcoming from recent literature, and it is unfortunate that Dr. Kent Hughes has not extended his communication to include some constructive suggestions for improving the state of affairs he rightly deplores. If he would consider making such additions, I would be personally much obliged.

It is unfortunate that there is so little opportunity for the teachers in applied medical sciences in the various universities coming together to discuss matters of common interest for the advancement of the art of medicine.

Yours, etc.,

E. S. MEYERS.

"Ballow Chambers",
Wickham Terrace,
Brisbane.
January 15, 1938.

AN ACKNOWLEDGEMENT.

SIR: With reference to my article "Immunity Studies in Diphtheria" appearing in your journal of January 8, 1938, I desire to acknowledge assistance afforded me by Dr. W. C. Sawers, School of Public Health and Tropical Medicine, and Dr. C. W. Adey, Commonwealth Serum Laboratories, Melbourne.

Yours, etc.,

H. L. CARRUTHERS.

Sydney,
January 21, 1938.

THE INSULIN TREATMENT OF SCHIZOPHRENIA.

SIR: Many of your readers will no doubt have much appreciated the fine paper read by Drs. Farran-Ridge and Reynolds on the insulin treatment of schizophrenia; but enthusiasm for any new form of therapy ought always to be tempered by strict accuracy of advocacy. This is not quite so in the paper above referred to, for among the patients "treated and improved" was one "obsessional neurosis". Now this young lady is neither improved nor cured. It is further stated that she was treated by psychoanalysis and that she became worse. This is also an incorrect statement, as she was never treated by psychoanalysis. She was interviewed by myself and Dr. Smeal on several occasions, and we both pronounced her unsuitable for analytical treatment. She certainly did make a slight improvement whilst in Mont Park, but it was due to her removal from a very unsuitable environment, not to the insulin that she received. It is not to be understood that I am criticizing insulin therapy, only pleading for accuracy in statement.

Yours, etc.,

PAUL G. DANE.

110, Collins Street,
Melbourne,
January 18, 1938.

Obituary.

RICHARD DENINGTON FISHER.

We regret to announce the death of Dr. Richard Denington Fisher, which occurred on January 4, 1938, at Mount Wallace, Victoria.

Books Received.

MASSAGE AND REMEDIAL EXERCISES IN MEDICAL AND SURGICAL CONDITIONS, by N. M. Tidy; Third Edition; 1937. Bristol: John Wright and Sons Limited; London: Simpkin Marshall Limited. Demy 8vo, pp. 468, with illustrations. Price: 15s. net.

CLINICAL CHEMISTRY IN PRACTICAL MEDICINE, by C. P. Stewart, M.Sc., Ph.D., and D. M. Dunlop, B.A., M.D., F.R.C.P.E.; Second Edition; 1937. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 372, with illustrations. Price: 10s. 6d. net.

A MANUAL OF OBSTETRICS, by T. W. Eden, M.D., Ch.M., F.R.C.P., F.R.C.S., F.C.O.G., and E. Holland, M.D., B.S., F.R.C.P., F.R.C.S., F.C.O.G.; Eighth Edition; 1937. London: J. and A. Churchill Limited. Demy 8vo, pp. 777, with 12 plates and 398 illustrations. Price: 24s. net.

THE DIAGNOSIS AND TREATMENT OF SEXUAL DISORDERS IN THE MALE AND FEMALE, INCLUDING STERILITY AND IMPOTENCE, by M. Huhner, M.D.; 1937. Philadelphia: F. A. Davis Company. Demy 8vo, pp. 603. Price: \$5.00 net.

THE THERAPEUTIC PROBLEM IN BOWEL OBSTRUCTIONS. A PHYSIOLOGICAL AND CLINICAL CONSIDERATION, by O. H. Wangenstein, B.A., M.D., Ph.D.; 1937. London: Baillière, Tindall and Cox. Super Royal 8vo, pp. 331, with illustrations. Price: 27s. net.

FOOD TABLES, by V. H. Mottram, M.A., and E. M. Radloff, B.Sc., Ph.D.; 1937. London: Edward Arnold and Company. Demy 8vo, pp. 63. Price: 5s. net.

PRACTICAL METHODS IN BIOCHEMISTRY, by F. C. Koch; Second Edition; 1937. London: Baillière, Tindall and Cox. Super Royal 8vo, pp. 311. Price: 10s. net. net.

PRIMARY CARCINOMA OF THE LUNG, by E. J. Simons, M.D.; 1937. Chicago: The Year Book Publishers Incorporated. Medium 8 vo, pp. 263, with illustrations. Price: \$5.00 net.

AN INTRODUCTION TO BACTERIOLOGICAL CHEMISTRY, by C. G. Anderson, Ph.D., D.Bact.; 1938. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 286. Price: 10s. 6d. net.

THEADELAIDE CHILDREN'S HOSPITAL PHARMACOPEIA; Second Edition; 1937. Adelaide: The Children's Hospital. Demy 24mo, pp. 52. Price: 2s. 6d. net.

GENITAL ABNORMALITIES, HERMAPHRODITISM AND RELATED ADRENAL DISEASES, by H. H. Young, M.A., M.D., Sc.D., F.R.C.S.I., D.S.M.; 1937. London: Baillière, Tindall and Cox. Super Royal 8vo, pp. 690, with 534 illustrations. Price: 45s. net.

Diary for the Month.

- FEB. 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 FEB. 2.—Western Australian Branch, B.M.A.: Council.
 FEB. 3.—Victorian Branch, B.M.A.: Branch.
 FEB. 3.—South Australian Branch, B.M.A.: Council.
 FEB. 4.—South Australian Branch, B.M.A.: Branch.
 FEB. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 FEB. 15.—New South Wales Branch, B.M.A.: Ethics Committee.
 FEB. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 FEB. 23.—Victorian Branch, B.M.A.: Council.
 FEB. 24.—South Australian Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," pages xiv to xvi.

AUCKLAND HOSPITALS BOARD, AUCKLAND, NEW ZEALAND: Radiotherapist, Radiologist.
AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Honorary Pathologist.
MARRICKVILLE DISTRICT HOSPITAL, MARRICKVILLE, NEW SOUTH WALES: Honorary Assistant Physicians.
TOOWOOMBA HOSPITALS BOARD, TOOWOOMBA, QUEENSLAND: Resident Medical Officer, Relieving Medical Officer.
THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Honorary Relieving Assistant Obstetrician and Gynaecologist, Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.I.

| BRANCHES. | APPOINTMENTS. |
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| NEW SOUTH WALES: Honorary Secretary, 135 Macquarie Street, Sydney. | Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17 | Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing. |
| SOUTH AUSTRALIAN: Secretary, 178 North Terrace, Adelaide. | All Lodge appointments in South Australia. All contract Practice Appointments in South Australia. |
| WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |

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